OFFICIAL PUBLICATION OF THE PROCEEDINGS AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

OCTOBER 31, 1949
VOLUME 38, NO. 22

AMERICAN DYESTUFF REPORTER

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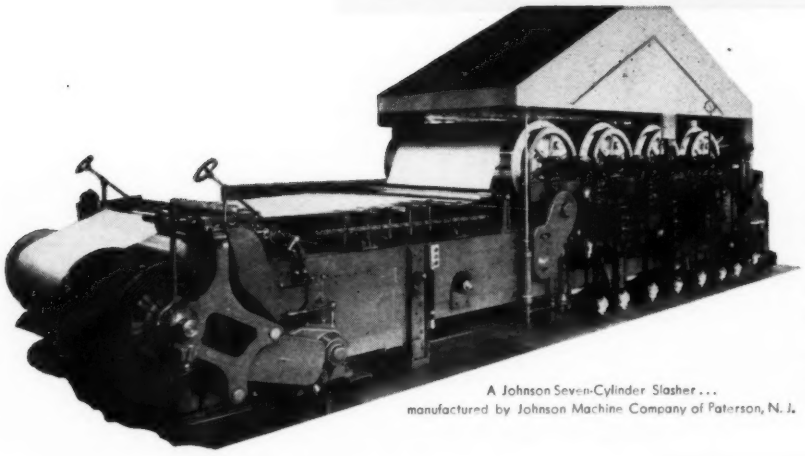

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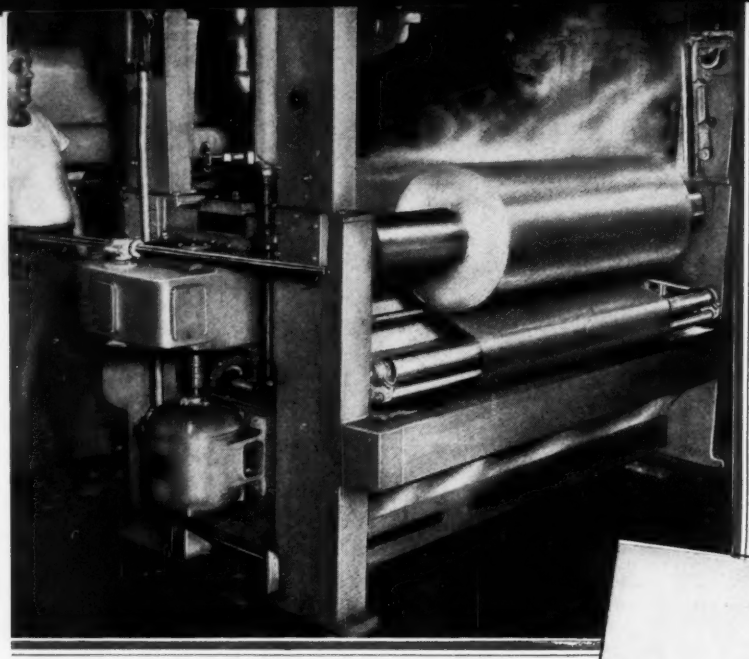

Actual photograph of Van Vlaanderen C.T.* Jig in operation at Vitromar Piece Dye Works, Hawthorne, N. J.

CT* A New Standard IN JIG PERFORMANCE

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Vitromar Piece Dye Works
Hawthorne, New Jersey

September 15, 1949

Mr. C. H. Van Vlaanderen, President
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President

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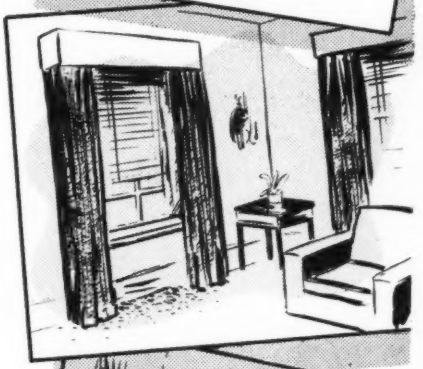

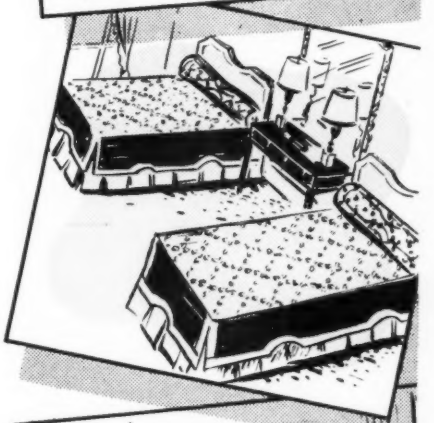

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OCTOBER 31, 1949
VOLUME 38 NUMBER 22

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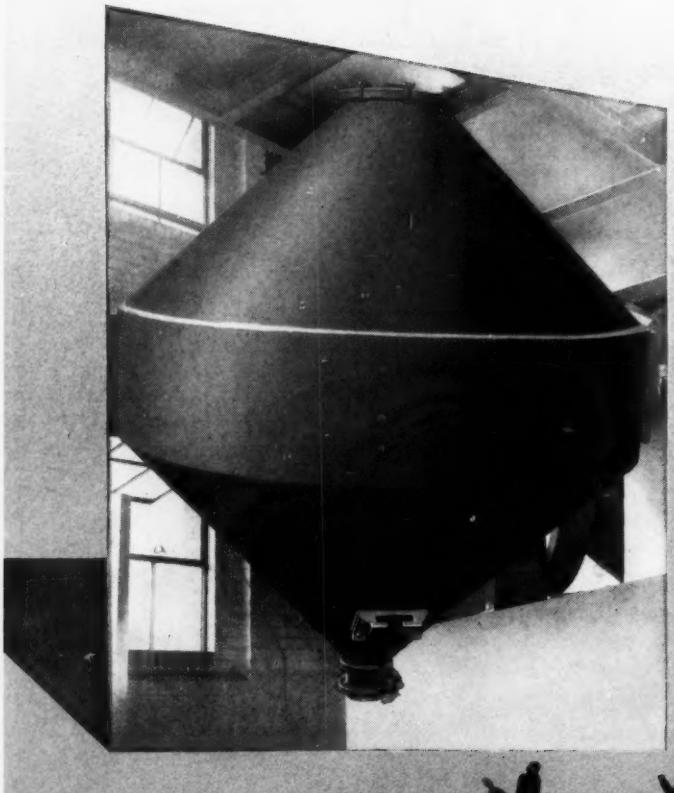
the BIGGER the blender

the BETTER the uniformity



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AMERICAN
DYESTUFF REPORTER

VOLUME 38 October 31, 1949 NUMBER 22

CONTROLLED FINISHING OF NYLON KNIT FABRICS*

A. J. NISBET
Triangle Finishing Corp., Johnstown, New York

NYLON is today and for some years past has been one of the most widely known and sought after products in existence. One would, therefore, believe that one of its outstanding talents (namely, its ability to take a "set") would also be widely and thoroughly understood, particularly throughout the textile trade. In general, the reverse appears to be true.

This nylon "setting" talent could be defined as the ability of the nylon fiber or fabric to be formed to a shape or a dimension which cannot easily be deformed or changed under the conditions of its intended use.

It is known that heat, moisture and time have been extensively employed to achieve a good measure of shape and dimensional stability in the nylon hosiery field. Those who have seen a nylon stocking which was not preset (preboarded) prior to any dyeing, wet processing or washing operation can appreciate the importance of presetting on shaped boards in preventing distorted stitches, improper fit, extreme variations from pair to pair and unsightly appearance. In preboarding, nylon stockings are placed on boards corresponding in shape to the leg and foot, placed in an autoclave and treated with saturated steam under a pressure of approximately 15 to 25 pounds per square inch corresponding to a temperature of 250°F. to 268°F. for a period of approximately 1 to 3 minutes. Finished hose so treated will have sales appeal, a clear stitch formation, proper fit and capability of repeated launderings even at a boil without wrinkling or sacrifice of any of these properties.

Nylon was first offered to the warp knit industry during 1940 or 1941. It soon became apparent that a method would be required for setting the fabric to minimize distortion of the fabric or garments and to achieve dimensional stability, shape retention and wrinkle resistance during wearing and laundering. Following the expedient path of least resistance, warp knit finishing departments and commission finishers gleaned a method from the hosiery industry. The method, changed very little today, consisted of rolling the fabric on a solid or perforated core and subjecting the unit to boiling water or to saturated steam in an autoclave for approximately one hour, to achieve a measure of penetration.

Nylon yarn as delivered for hosiery or warp knitting has a relatively high residual shrinkage in the range of from 4 to 9% depending upon prior processing. Setting of the fabric to obtain shape and dimensional stability under practical working steam pressures as well as consequent relatively low temperatures requires that the yarn and fabric be allowed to shrink to relieve the strains set up in the yarn during manufacture and processing, and in the fabric by the loop formation during knitting. Observation of preboarded hose will show that a decrease in length and volume takes place during the setting. Any attempt to fully restrain shrinking during preboarding will result in non-stable finished hose.

Such is the case with warp knit fabrics—in the steam autoclave or boiling water method, shrinkage of the yarn and fabric must take place during setting to obtain a measure of stability. With fabric on a roll the outer layers can shrink more freely than the inner layers with the result that non-uniform setting is obtained and variable widths obtained throughout the piece. Non-uniform penetration of the roll also results in non-uniform treatment, shrinkage and color acceptance. Because of the difficulty attendant to preparing a perfectly smooth roll when handling knit goods, creases were frequently set into the fabric. The industry in general has been plagued with non-uniform fabrics and fabrics which after finishing

* Presented before the September 7, 1949 meeting of the American Association of Textile Technologists.

continued to relax resulting in narrow and variable cutting widths as well as distorted or off-size garment sections.

Triangle Finishing Corporation, being a commission finisher, had long suffered with the deficiencies of the process and the righteous complaints of customers. Slightly over a year ago it was determined to do something about the known deficiencies and a development program was entered into which only a few months ago culminated in the announcement of what is called the "Trianized" nylon process.

It has long been known by the Nylon Division of the Du Pont Company that various setting media such as hot water, atmospheric steam, saturated steam under pressure, contact with heated surfaces, contact with high boiling liquids and heated air or other gases would in varying degrees "set" nylon yarn and fabrics with more or less satisfactory results depending upon the end use requirements. Such basic principles are covered by Du Pont patents.

A number of requirements for a new setting process were clear at Triangle. Among others were:

1. The dimension (both length and width of the fabric) must be accurately defined and, while in this condition, subjected to the setting medium.
2. The fabric must be treated in a single thickness to insure adequate and uniform penetration.
3. The precess must be continuous, rather than batch, for continued uniformity.
4. The setting medium must be accurately controlled with respect to temperature and heat transfer to the fabric.
5. The exposure cycle must be short and accurately controlled to secure productivity and uniformity.
6. If possible, the process should allow for control of fabric yield and stability without neeessarily allowing relaxation or shrinkage during the setting operation.

Following a full year of concerted effort in procuring and assembling or designing and constructing integral parts, Triangle has developed a process which to a large extent eliminates the objection to the old and places nylon knit goods closely akin to woven fabrics with respect to control of properties and uniformity.

To achieve the objectives previously enumerated, the development program evolved as follows:

A. To handle the fabric on a continuous single thickness basis and to accurately define the length and width dimensions, a pin tenter was constructed and equipped with automatic tension control, overfeed, and uncurling devices. In this unit the fabric selvedge is automatically fed to the pins. Complete control of fabric dimensions is achieved by varying the relative speed or width of the various units.

B. High temperature, high velocity air was selected as the setting medium and other means rejected for a number of reasons. Although apparently eminently satisfactory for heat treating woven nylon fabrics, contact with high temperature heated surfaces was rejected because of the extreme width of fabric being handled and the difficulty of obtaining uniform surface contact when handling knitted fabrics. Furthermore, because of the large range of fabric widths produced or required, telescoping heated surfaces with attendant non-uniform temperature would be necessary when used in conjunction with a tenter frame. Because of necessary complex recovery systems and difficulty in defining the cycle end point, high boiling liquid media were rejected. Pressure or super-heated steam systems were outlawed because of practical design and operating considerations. The problem appeared to resolve itself to the use of heated air or gases because of the relative ease of circulation and control. Lubrication problems, although still difficult, were minimized. It was surmised, therefore, that the application of heat and removal of heat could be accomplished quickly thus insuring accurate cycle control.

C. To secure control of fabric yield and stability without necessarily allowing relaxation or shrinkage during the setting operation, temperatures just under the melting point of nylon were employed. It has long been known and demonstrated by the Du Pont Company that nylon yarn of high residual shrinkage characteristics may be extended in length as much as 30 or 35% with an attendant reduction in residual shrinkage if subjected to temperatures approaching the melting point during processing. The contrary is found at relatively low temperatures. This principle has been found equally applicable when setting knitted fabrics. For example, the yield of a 40 denier 13 filament 2 bar warp knit jersey construction was increased 9% over that obtained with the beam set steam autoclave method with length and width residual shrinkage being 1% or less representing an approximate 66% reduction over the steam set fabric.

Of greater importance however, is the fact that the fabric dimensions and physical characteristics can be accurately controlled to insure the garment manufacturer uniformity of width, length and color so necessary in cutting and sewing and the greater wearing satisfaction to the ultimate consumer. Certain apparel and industrial fabrics which have previously resisted all efforts to properly finish with respect to appeal, appearance, yield or physical requirements have been successfully finished by this method.

Only the setting operation has been dealt with in this discussion. Trianizing, as we know it, is a number of processes depending upon the results desired and involves the development of volumes of know-how in all finishing operations. Rule of thumb operation of other departments must be eliminated and technical control instituted. For example, should an additional dressing or tentering operation be required, it is imperative that the fabric dimensions, tensions, and edge control be as accurately defined and controlled as during the setting operation.

Although Trianizing is a going process, there is daily addition to the know-how and continuance of research and development program which has already indicated further considerable improvement and possibilities. Fabrics of mixed or blended fibers, including nylon and cotton, wool, silk, viscose rayon, acetate rayon and Bemberg have been successfully "Trianized". The process may lend itself to the finishing of certain fibers other than nylon or nylon blends, though it is particularly well suited to the finishing of nylon lace, nettings and similar fabrics. Exceptional pattern definition is obtained with controlled open width setting.

Perhaps a word of caution would be in order for those who might contemplate any similar approach to the controlled finishing of nylon fabrics. The research, machine design and construction are time consuming and costly. No laboratory procedure has been found for accurately predetermining the production conditions or methods for any particular fabric style or construction. Costly large scale trials are, therefore, necessary to establish proper operating conditions. Full time operations is almost requisite in order to amortize the investment. The development of know-how is difficult and at times painful, particularly in operating equipment at temperatures approaching the melting point of nylon. Such temperatures present entirely new problems with respect to materials of construction, lubrication, expansion and contraction, etc. It is felt, however, that the results even to date have been well worth the effort.

THE HYDROSULFITES*

Production, Properties and Textile Applications

G. BREARLY and J. STARKIE

THE purpose of this paper is to review methods of producing the commercial hydrosulfites and sulfoxylates, to outline their properties, and to describe in detail several variations of the usual methods of application designed to deal with special textile problems. Physical methods of analysis also will be briefly discussed.

Methods of Production

HYDROSULFITES.—The manufacture of anhydrous sodium hydrosulfite on a commercial scale was first started at Ludwigshafen in 1905, and, while continued improvements have taken place and considerable research work has been undertaken, it is interesting to note that the original method, based on the use of zinc dust, is still responsible for practically the whole of the requirements of the world. These requirements, as will be readily appreciated, have long since passed any ideas which the early workers at Ludwigshafen may have had of the importance of hydrosulfites, for, in line with the increasing demand for the application of fast dyes are the demands made upon the industry by many varied industries far removed from textiles.

A general outline of the actual process of manufacture may thus be of interest—

Zinc dust suspended in water is treated with sulfur dioxide to give a solution of zinc hydrosulfite. This is treated with either caustic soda or soda-ash to give a solution of sodium hydrosulfite and a precipitate of zinc hydroxide or carbonate respectively. The precipitated zinc is removed by filtration, and, after the removal of traces of zinc, iron, etc., the hydrosulfite is precipitated as dehydrate by the addition of common salt or a mixture of common salt and alcohol. After allowing the needle-shaped crystals of the hydrosulfite to settle, the supernatant brine is removed, and the crystal suspension remaining is heated to 62°, when dehydration takes place. The anhydrous sodium hydrosulfite is filtered off, washed with alcohol, dried *in vacuo,* sieved, standardized, and filled into sealed containers. The various stages are represented by the equations—

$$Zn + 2SO_2 = ZnS_2O_4$$

$$ZnS_2O_4 + 2NaOH = Na_2S_2O_4 + Zn(OH)_2$$

$$Na_2S_2O_4 + 2H_2O \rightleftharpoons Na_2S_2O_4,2H_2O$$

Since 1911 many attempts have been made to establish the commercial production of sodium hydrosulfite by the electrolysis of a solution of sodium bisulfite. It is known that the Bayer firm at Leverkusen did actually succeed about 1923, but only on a limited scale, and, in spite of the increasing demand for the product, the project was finally abandoned in 1930.

A third method, devised by Kinzelberger *(1)* in Austria, is based on the reaction between sodium formate and sulfur dioxide or that between sodium metabisulfite and ammonium formate. This latter reaction can best be represented by the equation—

$$Na_2S_2O_5 + H{\cdot}COONH_4 = Na_2S_2O_4 + NH_4HCO_3$$

This method has in the past found a certain limited commercial application in Czechoslovakia and England.

SULFOXYLATES. — The sulfoxylates are manufactured by treatment of zinc hydrosulfite solution with an aldehyde and further reduction with zinc dust. If the sodium salt be required, the zinc is precipitated by the addition of caustic soda and filtered off, and the solution of the sodium salt is concentrated *in vacuo.* The syrupy molten material is allowed to set in moulds, after which it is broken into lumps or ground to a fine powder.

The formaldehyde and, to a very small extent, the acetaldehyde derivatives are used in commerce; other aldehyde derivatives have been prepared, but have been found to be of little interest on the manufacture of the sulfoxylates may be represented by the equations—

Normal Zinc Formaldehyde-sulfoxylate

$$2ZnS_2O_4 + 4H{\cdot}CHO + 2H_2O = Zn(HSO_2{\cdot}CH_2O)_2 + Zn(HSO_2{\cdot}CH_2O)_2$$

The solution is concentrated *in vacuo* to the point where the sulfoxylate crystallizes out; it is then filtered from the solution of the zinc formaldehyde-bisulfite, after which it is dried *in vacuo.*

Basic Zinc Formaldehyde-sulfoxylate

$$Zn(HSO_2{\cdot}CH_2O)_2 + Zn(HSO_2{\cdot}CH_2O)_2 + 2Zn + 2H_2O = 4Zn(OH)(HSO_2{\cdot}CH_2O)$$

Zinc dust is added to the mixed bisulfite-sulfoxylate solution, which is then raised to the boil to form the basic zinc formaldehyde-sulfoxylate. This product, which is insoluble in water, is filtered off, dried, and ground.

Sodium Formaldehyde-sulfoxylate

$$Zn(OH)(HSO_2{\cdot}CH_2O) + NaOH + H_2O = NaHSO_2{\cdot}CH_2O,2H_2O + ZnO$$

In addition to the above formaldehyde derivatives, the only two other products which have a very limited textile application are—

Zinc Acetaldehyde-sulfoxylate

$$ZnSO_2{\cdot}CH_3{\cdot}CHO$$

Sodium Benzaldehyde-sulfoxylate

$$NaHSO_2{\cdot}C_6H_5{\cdot}CHO$$

Properties

HYDROSULFITES—Sodium Hydrosulfite $Na_2S_2O_4$—The commercial products fall into three groups—

(1) *Hydrosulfite and Blankit* (IG), *Hydros* (Br), *sodium hydrosulfite* (LBH, Hardman & Holden Ltd., and J. B. Wilkinson)—Sodium hydrosulfite of approx. 90% $Na_2S_2O_4$ content with the addition of a small percentage of sodium carbonate or sulfite as stabilizer. Used for vat dyeing and printing and fiber bleaching; used also for the bleaching of soap, oils, fats, glues, gelatine, and China clay, and in sugar refining.

(2) *Blankit I* (IG), *Hydros I* (Br), *Arostit BL* (S), *Clarite PSE* (Gy)—Sodium hydrosulfite (2 parts) with addition of anhydrous sodium pyrophosphate 1 part). Used for silk and wool bleaching, and cleaning white cotton threads in vat-dyed materials (e.g. football jerseys).

(3) *Burmol* (IG), *Laundros* (Br), *Snowdros* (LBH), *Arostit* S. (S)—Sodium hydro-

* Presented at meeting of Northern Ireland Section, Society of Dyers and Colourists, January 14, 1948. Reprinted from their "Journal", August, 1948.

sulfite with addition of sodium carbonate. Used as a stain remover in laundry work.

Sodium hydrosulfite dissolves in about five times its weight of water at ordinary temperature. Solutions should be made only as required, and should be protected from undue exposure to air in order to avoid loss in strength by oxidation. Stability of the solution is improved by the addition of a small quantity of alkali. The addition of large quantities of caustic soda may in certain circumstances give rise to the formation of sodium sulfide, and work on this problem suggests that the following reaction occurs—

$$3Na_2S_2O_4 + 6NaOH \rightarrow Na_2S + 5Na_2SO_3 + 3H_2O$$

When solutions are being made, it is recommended that the hydrosulfite be stirred into the water at the rate at which it dissolves. On no account should water be added to the hydrosulfite, as decomposition is likely to occur.

The solid product in the usual commercial sealed container can be warehoused for considerable periods without significant loss in strength, always provided it is stored in cool and dry surroundings. It is of interest that, when the powder is exposed to the atmosphere, the strength rapidly falls from 90% to 75%, at which it remains for some time before there is a further marked fall. This is considered to be due to the stabilizing effect of the sodium sulfite resulting from the first phase of decomposition. Hydrosulfite solutions are reasonably stable down to *p*H 5, and solutions for storage usually have a *p*H about 10. Too much stress cannot be laid upon the necessity for proper storage of the solid product, the use of dry scoops, and the replacement of the lid of the container after the removal of a portion of the contents. Under specially favorable conditions sodium hydrosulfite can decompose exothermally with the liberation of about 10,350 calories per gram-molecule of the substance, when the color changes through yellow to brown with the formation of free sulfur, which finally may ignite spontaneously and burn with a small bluish flame. In the event of such an extremely rare occurrence, the flame is readily extinguished by the addition of sand or dry earth, or by flooding with a large quantity of water. The addition of a small quantity of water accelerates the reaction.

SULFOXYLATES — The commercial products fall into three main groups—sodium formaldehyde-sulfoxylate with or without additions, normal zinc sulfoxylates, and basic zinc sulfoxylates.

1. Sodium Formaldehyde-sulfoxylate $NaHSO_2CH_2O,2H_2O$—*Rongalite C* (IG), *Formosul* (Br), *Erasol* (LBH), *Hydrosulfite FD* (Gy), *Hydrosulfite R* (S), *Hydrosulfite R* (Ciba)—Used in vat-color printing discharging, and stripping; also for glue bleaching.

This product appears either in small lumps or as a fine white powder of approx. 100% strength, which, in the absence of moisture, keeps for long periods unchanged. Solubility at normal temperatures is approximately one part of sulfoxylate in one part of water. It readily forms supersaturated solutions. Treatment with an excess of sodium bisulfite results in the formation of the formaldehyde-bisulfite and -hydrosulfite. Normal sulfite reacts to form formaldehyde-bisulfite and caustic soda. Sodium formaldehyde-sulfoxylate is insensitive to the action of alkalis, but is readily decomposed by acids. Solutions are stable down to about *p*H 3.

Sodium Formaldehyde-sulfoxylate with Additions—*Rongalite CL* (IG), *Formosul CL* (Br), *Erasol CL* (LBH), *Arostit RLF* (S)—A mixture of sodium formaldehyde-sulfoxylate (approx. 2 parts) and Leucotrope W (1 part). A pale yellow powder, which must not be exposed to moisture, used mainly for the discharge of Indigo-dyed cotton.

Rongalite CW (IG), *Formosol CW* (Br), *Erasol CW* (LBH), *Hydrosulfite RW* (S), *Hydrosulfite FDW* (Gy), *Hydrosulfite RWS* (Ciba)—A mixture of sodium formaldehyde-sulfoxylate (approx. 2 parts) and zinc oxide (1 part). A white powder used principally for producing white discharge styles on wool and silk.

2. Normal Zinc Formaldehyde-sulfoxylate $Zn(HSO_2CH_2O)_2$—*Decroline sol*, conc. (IG), *Redusol Z* (Br), *Vacolite* (LBH), *Arostit ZET* (S), *Hydrosulfite Z water-soluble* (Gy), *Hydrosulfite BZ water-soluble* (Ciba)—Used for stripping and for discharge printing on silk goods, used also for soap bleaching by the Twitchell process. A white crystalline product of approx. 90% strength, which must be stored under perfectly dry conditions, and which dissolves in water at ordinary temperatures to the extent of approx. 25%—

	25°C.	12°C.
Grams of Redusol Z per 100 g. of solution	20.7	20.7
Grams of Redusol Z per 100 cc. of solution	25.5	25.0
Grams of Redusol Z per 100 cc. of solution (supersaturated)	40	>30

3. Normal Zinc Acetaldehyde-sulfoxylate $Zn\ SO_2CH_3CHO$—*Decroline AZA* (IG)—A white powder of approx. 80% strength, insoluble in water. Used for special printing purposes, and, in conjunction with chlorine, for stripping certain types of dyes.

Basic Zinc Formaldehyde-sulfoxylate.. $Zn(OH)(HSO_2CH_2O)$ — *Decroline* (IG), Zinc *Formosul* (Br), *Zinc Erasol* (LBH), *Hydrosulfite Z* (Gy), *Hydrosulfite Z* (S), *Hydrosulfite B* (Ciba)—A white or grey powder, insoluble in water, and stable during storage over prolonged periods. Used in stripping low woolens and rags. Supplanted in the printing industry by the normal zinc and the sodium salts.

Textile Applications

DYEING—The general methods for the vatting of dyes and the control of the dye-vat are well known, and have changed little for some time. In recent years attention in the U.S.A. and Germany has centered on the so-called Vat Acid Process and on the development of a continuous method. Practical experience, however, now appears to suggest that the former will not find extensive application, but may continue to be used for special purposes in yarn and piece dyeing. The advantages of improved penetration in heavier cotton piece goods and uniformity in package dyeing are offset by the additional operations required in the preparation of the vat.

In Germany during the war, when large quantities of rayon filament and staple had to be dyed for mixtures with wool, advantage was taken of the Eclipsol process of J. R. Geigy A.-G., by which sulfur colors are dyed with Rongalite and soda, since this permitted large containers packed with the fibers to be dyed thoroughly in the Obermaier machine.

Mention should be made here of the extensive researches on the application of vat dyes to viscose yarn carried out at the Droylsden Laboratories of Courtaulds Ltd., which were described in the paper by Wilcock published in this *Journal* in May 1947 *(2)*.

The Stabilization of a Hydrosulfite-Caustic Soda Bath.

In 1937 the authors investigated the problem of the dyeing of Indigo by a padding process, with a view to saving time and expense in the dyeing of light colors required for discharge styles for the African trade. The problem resolved itself into finding a method of stabilizing the vat to permit an even dyeing throughout a run of, say, 1000 yd. of material. The following method was developed and used on the works scale—

Stock Vat—7½ lb. Indigo 20% paste, 5 pints caustic soda 70° Tw., 5 lb. Hydros, 4 pints British gum, 22½ gal. water at 60°C. After standing for 10 min., when the vat was in a properly reduced condition, a solution of 1 lb. sodium pyrophosphate in 2 pints water at 50°C. was added, and the vat allowed to stand for a further 10 min.

A portion of this stock vat was added to the padding box, and the remainder to the feed tank of the machine shown in Fig. 1. Bleached calico was then passed through, and, in a trial run after the process had been in operation for some time, nine pieces, totalling 1000 yd., were used and patterns taken, one towards the end of each piece, and labelled 1 to 9. The patterns showed the even results obtained.

and the bath in the padding box was still in perfect condition at the end of this run.

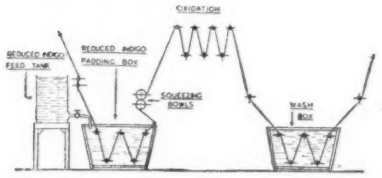

Fig. 1—Dyeing of Indigo by Padding Method.

Although success appeared to have been achieved with regard to the stability of the bath, since the object of using a padding process is speed of production, two other problems arose which so far have not been completely solved. To avoid the rapid exhaustion of the bath, it is necessary to add a detergent to restrict the affinity of the dye. Penetration had not been achieved, and too much color was merely lying on the surface. The use, prior to the entry of the material into the hot flue, of a developer to correct this is under investigation. This work is mentioned in its as yet uncompleted form, since in any process of continuous vat dyeing a stabilized vat should permit more economical working.

Returning to the subject of phosphate additions, in 1943 the further observation was made that, if for special reasons it is required to work a dye-vat at the elevated temperature of 65-67°C., the addition of sodium pyrophosphate reduces the loss in color strength yielding dyeings approximating in strength those obtained at the more usual temperature of 55-60°C.

The following experiment, in which 10 g. of cotton was dyed, exemplifies the type of result obtained—

VAT—
1 g. Caledon Blue RS Paste (ICI).
0.5 g. Hydros.
3 c.c. caustic soda (72° Tw.)
Liquor ratio 30:1.
DYEING CONDITIONS—
(1) 60°C., no addition to vat.
(2) 60°C., + 0.1 g. sodium pyrophosphate.
(3) 70°C., no addition to vat.
(4) 70°C., + 0.2 g. Hydros to restore condition of vat.
(5) 70°C., + 0.1 g. sodium pyrophosphate.
(6) 80°C., no addition to vat.
(7) 80°C., + 0.2 g. Hydros to restore condition of vat.
(8) 80°C., + 0.1 g. sodium pyrophosphate.

Order of Strength of Dyeings—(2)> (1) > (4) = (5) > (7) = (8) > (3) > (6). The weakness in the dyeings of (1), (3), and (6) is due to the color falling out of solution, as is confirmed by exhaust dyeings being almost white. (7) and (8) are very little weaker than (4) and (5). As the two dyeings of each of these pairs are practically equal in strength, it may be concluded that the addition of 0.1 g. of sodium pyrophosphate gave a strength equal to that obtained by adding an extra 40% of Hydros.

At a still dater date, the effect of adding pyrophosphate to solve a problem connected with the dyeing of rayon cakes in a circulating machine was studied. Difficulty was being experienced in circulating a hydrosulfite solution through rayon cakes previously vat pigment-padded in a machine which allowed considerable exposure of the liquor to the atmosphere.

A viscose cake (400 g. dry cellulose) was pigment-padded in a bath containing 5% Caledon Jade Green XN (300 fine paste) (ICI) with a liquor ratio of 30:1 and the addition of 5 c.c. Dispersol VL (ICI) per liter of liquor. The liquor was circulated for one hour at 80-90°C. and for a further hour with a drip-fed addition of 2.5% common salt on the weight of the cake. Circulation was continued a further 30 min., during which time the temperature fell to 60°C. At this stage 70 c.c. caustic soda (72° Tw.) and 40 g. Hydros were added and circulation was continued, but after 15 min. oxidation had occurred before the color was completely reduced and properly dyed.

The experiment was repeated with the following modifications—

(a) Five minutes after adding the caustic soda and Hydros, 8 g. of sodium pyrophosphate dissolved in 200 c.c. of water at 60°C. was added. The liquor remained in a perfectly reduced state for 35 min.

(b) A further modification in which the quantity of caustic soda was reduced by 10% and the pyrophosphate increased to 16 g. was made. The liquor in circulation was still in a perfectly reduced state after an hour. The *p*H of the liquor was recorded, and showed the following changes:

After addition of caustic soda....	11.5
After addition of Hydros.....	10.75
After addition of sodium pyrophosphate	9.1
After 45-min. circulation.....	8.2

PRINTING AND DISCHARGE PRINTING—Here, again, the general methods are well known, but one or two special points in connection with the discharging of acetate-rayon colors may be mentioned, as they illustrate the necessity for selecting the proper sulfoxylate for the special purpose required. Sodium formaldehyde-sulfoxylate is not as suitable for the discharge of direct colors as are the basic and normal zinc salts, which are improved by the addition of anthraquinone, Peregal O, Lubrol W, etc. In the case of color discharges using vat dyes, the basic zinc salt is superior to the normal zinc salt. Similarly, for color-discharging vat dyes and for discharging in presence of discharge-resisting acetate dyes, a mixture of the sodium salt and the normal zinc salt gives the best results. It is not possible to discharge fully all the anthraquinone derivatives of the acetate range of dyes, blues in particular being somewhat difficult, but no doubt in time more easily dischargeable dyes will be added to the present available range. In the case of resist styles incorporating certain dyes, it has been claimed that the correct color is obtained only by using sodium benzaldehyde-sulfoxylate instead of one of the formaldehyde derivatives. The hydrosulfite manufacturer is aware of the possibilities which would be opened up to the silk printer by the availability of reducing agents which will not have the salting-out properties of a strong electrolyte.

STRIPPING—Stripping has already been the subject of a lecture to the Society by one of the present authors *(3)*. Discussion at the conclusion of that lecture suggests that there was wide interest in the stripping or partial stripping of vat dyes, and further details on that particular aspect of the subject may therefore be of interest.

In the case of the stripping of azo dyes, the dye is split into products which are amines, and hence soluble in dilute acids, and it is considered that these amines, having smaller molecules than the original dye, are easier to remove. Vat dyes, on the other hand, are not split in this manner, but are reduced to their leuco form, and an attempt has therefore to be made to agglomerate or make insoluble the removed particles of dye to prevent redyeing. The vat dye is considered to be on or near the surface of the individual fibers. In the case of the stripping of dyed acetate rayon, where the dye is considered to be in solid solution, the zinc sulfoxylates are more effective than the sodium salts; a sodium hydrosulfite bath, however, may be employed, but special additions are then necessary.

In conformity with these general principles, the methods for the stripping of vat dyes are based on the addition to the stripping bath of products of the type of Dispersol VL, Albatex PON Conc., Peregal O, and Lubrol W, together with a small quantity of magnesium sulfate. The action of the magnesium sulfate is not fully understood, but it appears to assist the Dispersol VL in making the removed leuco dye insoluble in water. The results obtained are superior to those obtained by the Hydros- Lissolamine V or the Hydros—Leucotrope method.

Details of the methods are as follows—

Stripping of Vat Dyes from Cotton

Stripping Bath—7.5 g. Hydros; 15 g. Dispersol VL (ICI) Albatex PON Conc. (Ciba), or Peregal O (IG) or 3 g. Lubrol W (ICI); 15 c.c. caustic soda (72° Tw.) per liter of water with a liquor ratio of 40:1.

The material is entered at 90°C., and worked for one hour at 95-100°C.; 3-5 g. magnesium sulfate per liter is then added to the bath, which is worked for a further 30 min. The material is then well washed in water.

Stripping of Vat Dyes from Viscose Rayon.

The method is the same as that employed for the stripping of cottons, except that the temperature is maintained at 80-90°C. for thirty minutes, the magnesium sulfate added, and the stripping allowed to continue at the same temperature for a further twenty minutes. The goods are removed and washed, and, if necessary, the process may be repeated. A complete strip by this process is not possible, but the following results obtained by the I.G. Farbenindustrie A.-G. on an extensive range of Indanthrene dyes show that, with few exceptions, 90% or more of the dye can be removed by this method. In this particular set of experiments the stripping bath contained 10-15 c.c. caustic soda (72° Tw.), 5 g. sodium hydrosulfite, and 10-15 g. Peregal O per litre. The temperature was maintained at 70°C. for 90 min., after which 5 g. magnesium sulfate per liter was added; the temperature was maintained a further 30 min. at 90°C., after which the patterns were washed in cold water.

Stripping of Indanthrene Dyes

Dye	*Percentage removed*
Yellow G	70
Yellow 5GK	approx. 100
Brilliant Orange GK	90
Golden Orange G	90
Orange F3R	80
Orange HR	80
Scarlet GG	80
Brilliant Pink B	approx. 100
Red 5GK	approx. 100
Bordeaux B	90
Brilliant Violet BBK	approx. 100
Brilliant Violet RK	90
Blue BC	90
Blue 3GF	85
Blue 3G	80
Marine Blue BF	80
Blue Green FFB	80
Green BB	80
Olive Green GG	80
Olive 3G	80
Olive T	85
Brown 3R	90
Red Brown R	80
Grey MS	80
Direct Black RB	80
Yellow GK	approx. 100
Yellow 3R	80
Brilliant Orange GR	90
Golden Orange 3G	85
Orange RRK	90
Scarlet B	90
Scarlet R	90
Red FBB	80
Red RK	80
Rubin B	90
Brilliant Violet 3B	80
Brilliant Violet 4R	90
Blue GCD	90
Blue RS	80
Dark Blue BOA	80
Marine Blue R	70
Brilliant Green B	90
Olive Green B	90
Khaki GG	60
Olive R	90
Brown BR	90
Red Brown GR	60
Grey M	90
Direct Black B	80

From this table it will be seen that a strip in the 80-90% range was obtained with approx. 90% of the dyes.

The I.G. Farbenindustrie A.-G. also carried out an investigation on the stripping of their Celliton range of acetate-rayon dyes with either a reducing strip, an oxidizing strip, or a combination of both.

Reduction Bath—3 g. Decroline AZA, 1.5 c.c. 85% formic acid, 0.3 g. Igepon T per liter of solution. Treated for 1 hour at 80-85°C.

Oxidation Bath—1.5 g. active chlorine (sodium hypochlorite solution 0.6° Tw.) and dilute acetic acid. Treated for 30 min. in the cold.

When the combined strip was employed, the reduction preceded the oxidation bath. Results varied according to the constitution of the dye. With an azo dye of the Celliton Scarlet B type, a complete strip was obtained by the reduction method *above*, whereas with an anthraquinone type such as Celliton Fast Pink RF only incomplete removal was possible. The diphenylamine types gave varying results.

Stripping of Nylon.

This subject was dealt with at some length in the lecture already referred to *(2)*. A point of special note is that the work carried out to date indicates that the stripping process in the case of nylon is a slow one, but that a satisfactory strip is in most cases possible by the use of a sulfoxylate. Recently, we have investigated the stripping of nylon dyed with Metachrome dyes.

A series of experiments has been carried out to ascertain the stripping properties of Metachrome colors dyed on nylon as compared with Metachrome colors dyed on wool, the following colors being used—

Metachrome Orange R *(Color Index*, No. 40).

Chrome Yellow MYS (Br).

Metachrome Bordeaux 3RN (Br).

Metachrome Brown R (Br).

Metachrome Brown BR (Br).

Stripping tests made by the general recipes, using 4% of Formosul and 3% of 85% formic acid and boiling for 30 min., gave the following results—

(1) Metachrome Orange R—This product gave a very good strip. A much clearer white was obtained on nylon than on wool.

(2) Chrome Yellow MYS—This product, too, gave a very good strip, and a much clearer white was obtained on nylon than on wool.

(3) Metachrome Bordeaux 3RN—When the general recipe was used, it was found that the dyeing on nylon produced only a half strip, and, before a result equal to that on wool could be obtained, it was necessary either—

(a) to increase the boiling time to one hour, or

(b) to employ a double strip, the material being first stripped with 4% of Formosul and 3% of 85% formic acid at the boil for 30 min., and cooled down to 50°C.; 2% of Formosul and 1% of 85% formic acid are then added, and the bath is brought to the boil and boiled for a further 20 min.

(4) Metachrome Brown R—This product did not appear to strip with Formosul, with either prolonged boiling or a double strip, and it was found necessary to give a double strip using Redusol Z in place of Formosul before a good result was obtained.

(5) Metachrome Brown BR—This product did not appear to strip with prolonged boiling, but did so with a double strip. A fairly good result was obtained, which was further improved by replacing Formosul by Redusol Z.

An interesting and unusual stripping problem was that of the removal of the color from cotton pieces which had been dyed with a color which is quite suitable for white and color discharge work, but which will not strip by the usual stripping methods. In this case, the color is removed by the padding and steaming process. The following recipe was used for treating 500 yards of calico which had been dyed unevenly with Chrysoidine coupled with diazotized *p*-nitroaniline—

The material is padded through a 20% solution of Formosul at 140°F. (60°C.), containing 0.25% Gardinol on the volume of liquor, squeezed, dried, and steamed at 212°F. (100°C.) for 5 min.; it is then washed in a hot bath and dried. The material is stripped to the original white, subsequently dyed with Indigo, and printed with a white discharge pattern using Formosul CL.

Analytical Methods

During the past twenty-five years the hydrosulfites have become of increasing importance to the textile industries, and the appearance of each new dye which may have to be discharged, stripped, or dyed by the use of a hydrosulfite, together with the appearance of new textile fibers with their varying resistances to reducing agents, acids, and alkalis, has given rise to an increasing number of problems for the dyer, printer, dye manufacturer, and hydrosulfite manufacturer. Experience has shown that, probably owing to the use of different types of apparatus, and other differences in local conditions, two dyers requiring to achieve the same result will each favor the use of a different product, and thus it becomes extremely difficult to generalize in formulating methods of application. Owing to the reactive nature of these products, work on the laboratory scale, particularly when analytical control of the operations is required, is not without its difficulties, and in this connection

we have already commenced work with a view to substituting physical for chemical methods in the analysis of hydrosulfite derivatives. The polarograph has been brought into service, and some interesting results have already been obtained.

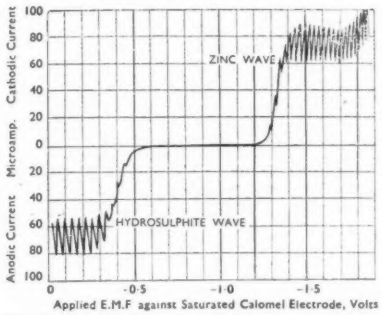

Fig. 2—Anodic Wave of Hydrosulfite and Cathodic Wave of Zinc in the Polarographic Analysis of Zinc Hydrosulfite.

Fig. 2 is a polarogram of zinc hydrosulfite in ammonium phosphate solution, obtained automatically with a dropping mercury electrode. Measurement of the wave heights gives the respective concentrations of hydrosulfite and zinc.

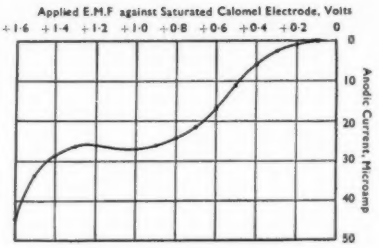

Fig. 3—Polarogram of Sodium Formaldehyde-sulfoxylate, 0.01M Solution in 0.1N Nitric Acid, obtained by Manual Method with Stationary Platinum Microelectrode.

Fig. 3 is a current-voltage curve for a solution of sodium formaldehyde-sulfoxylate in dilute nitric acid, obtained manually with a stationary platinum anode.

The half-wave potential of the hydrosulfite wave is at 0.4 volt compared with the saturated calomel electrode, which is well separated from the polarographic waves of the sulfite, thiosulfate, and sulfide ions, which begin at 0.1 volt, 0.2 volt, and 0.8 volt respectively. Thus the polarographic method serves for the detection and determination of hydrosulfite in the presence of these ions, and may therefore be regarded as more specific than any of the chemical methods available.

The use of the *p*H-meter with a glass electrode also has proved of great value in studying the behavior of the hydrosulfites under different conditions. This work, we hope, will result in devising works' methods, which will assist the dyer and printer in his day-to-day control of his operations.

In this brief review we hope that we have succeeded in explaining the constitutions and properties of a group of compounds which are probably not as well known as those of other chemicals which the dyer and the printer are called upon to use. We hope, too, that the references to a few special problems may give the reader some ideas which may be of use in finding solutions to his own problems.

In conclusion, we wish to thank several of our colleagues who have carried out experimental work to which reference has been made, and also to express our gratitude to Messrs. Brotherton & Co. Ltd. for permission to publish this paper.

References

1. B. P. 25,872 (1910).
2. This "Journal", 1947, *63*, 136.
3. Starkie, ibid., 1947, *63*, 340.

ABSTRACTS

The Spectrophotometer as an Aid to Dyeing

Frederick T. Simon, Textile Research Journal, page 567, Vol. XIX, No. 9, September, 1949.

Dyeing as it is known today in the textile industry is a technical process which has recently graduated from the stage of being an art to becoming a science. The primary thing responsible for this change is the control of the variables in the process. The spectrophotometer is a physical tool which is eminently suited to measure the most important variable of all: the shade and strength of the dyestuffs themselves, whether they be in solution or on the fiber. The general principle of operation of several of these instruments is explained. In practical applications of color measurement, some of the techniques employed to obtain and translate spectrophotometric data into useful information are discussed. Examples of these are: standardization of both water-soluble and certain insoluble dyes; measurement of production dye-mixture solutions and print pastes in order to control the color before their use on fabric; qualitative and quantitative estimation of dyes on the fiber; and study of the mechanism of the dyeing process itself.

Short Aging Processes for the Printing of Synthetics, Silk and Wool

DuPont Technical Bulletin, page 112, Vol. 5, No. 3, September, 1949.

The printing of synthetic fibers, silk and wool has always presented a problem of correlating three equally important factors. Optimum color fastness and value are balanced against economy of operation. The influencing factor is the aging time. With acetate, acid and direct color prints, cottage steaming for one hour is required to obtain the best value and fastness. Shorter steaming periods in cottage or other types of steamers have been employed but a corresponding reduction occurs in dye fixation and yield. This article discusses the results of work done in the laboratory and the new developments in short aging processes which offer the fastness and color value of older cottage steaming methods produced more economically in a rapid ager or tower ager.

Spectrophotometry

DuPont Technical Bulletin, page 121, Vol. 5, No. 3, September, 1949.

The scope of spectrophotometry is constantly broadening in the industrial field. The spectrophotometer has become an invaluable adjunct in research and analysis as well as in routine control testing. At DuPont's Technical Laboratory it has been adapted to a number of important operations which it performs speedily and which by other methods, normally consumes considerable time. This article describes in simple terms the underlying principles of spectrophotometry and how it is used in determining the strength and brightness of a dye. There are numerous illustrations and diagrams.

Machine Printing of Textile Fabrics

C. B. Peake, Canadian Textile Journal, page 44, Vol. LXVI, No. 16, August 5, 1949.

This is the third in a series of four installments of this article. Discussed in this installment are the following items: direct printing, application of vat colors, the vat printing paste, reduction gums, conversion formulas, the Indigosol colors, application of modern azoic colors, the naphthol-nitrite process, application of rapid fast colors, and application of Rapidogen colors.

The Cross-Linking of Animal Fibers
I—3:4-*iso*-Propylidene 1:2-5:6-Dianhydromannitol

C. W. Capp and J. B. Speakman, Journal of the Society of Dyers and Colourists, page 402, Vol. 65, No. 8, August, 1949.

The authors' abstract follows:

When animal fibers are treated with 3:4-*iso*propylidene 1:2-5:6-dian-hydromannitol for 24 hours at 50°C. in acid solution, cross-linking is brought about by reaction with the carboxyl groups of salt-linkages. The reaction proceeds more slowly at temperatures below 50°C., and degradation is severe at high temperatures because of attack on the disulfide bonds. Under optimum conditions at 50°C. the extent of cross-linking is small, giving only about 7% increase in the resistance of the fibers to extension in water at 22.2°C., but even this limited amount of cross-linking causes an appreciable reduction in the milling shrinkage of flannel. As the scaliness of the fibers is unaltered, the reduced shrinkage must be referred to the modified elastic properties of the fibers, in agreement with the results of experiments with other cross-linking agents.

Correlation of Simulated Rainfall Tests with Laboratory Penetration Tests

M. I. Landsberg, Roger Kelly and Dorothy Sinski, Textile Research Journal, page 505, Vol. XIX, No. 8, August, 1949.

The rainroom is recognized as a valid testing device, but its operation is costly and time-consuming and requires much personnel. This study was undertaken in an effort to establish a correlation between rainroom results and data obtained by much simpler and more economical laboratory tests. The study involved the establishment of two separate correlations: first, between rainroom results using the two different methods of testing: (1. garments worn on human test subjects; 2. swatches clamped on fabric holders) and second, provided a satisfactory relationship is found in the first, between laboratory data and the results of rainroom tests using fabric holders. The following conclusions were reached:

1. Data obtained using fabric holders correlate quite well with data obtained from garment wearing tests. Specimens tested on holders may be used in lieu of garments on human subjects to estimate the approximate protection afforded by fabrics under a specified rainfall.

2. The most probable rainroom protection time of a fabric treated with a durable water-repellent compound can be estimated from the results of laboratory penetration tests by use of the equations: Log $Y=a+b$ log X for the Du Pont, drop-penetration and Bundermann tests; and log $Y=a+bX$ for the hydrostatic tests.

3. The drop-penetration, Bundesmann and Du Pont tests are equally reliable for estimating the rainroom penetration time of single and double layers of fabric which resist penetration under a 1- and 3-inch rainfall, respectively, for a few minutes to approximately 24 hours. The complexity of the Bundesmann apparatus and its relatively limited range preclude its general acceptance as a test instrument.

4. The hydrostatic-pressure test correlates well within this range of water resistance, but is apparently less sensitive to factors which influence rain protection than the other tests, and hence appears to be inherently less reliable.

5. For fabrics possessing a very high degree of water-resistance (5 to 100 hours for single layers under a 3-inch-per hour rainfall) the drop-penetration test appears to be the only method which can be used to estimate rainroom penetration. Within this range of water-resistance the DuPont rain test is a poor index of rain protection and the hydrostatic test shows no correlation with the rainroom data.

New Principles in the Continuous Dyeing of Wool

R. Casty and E. Krahenbuhl, Journal of the Society of Dyers and Colourists, page 381, Vol. 65, No. 8, August, 1949.

Wool, in any form, when impregnated with dye from a cold or warm, neutral or slightly alkaline, solution and then passed for 2-10 minutes through a boiling solution of dilute acid absorbs the dye evenly and acquires the shade and fastness properties of a normal dyeing. The concentration of dye in the impregnating bath should be rather high to enable a dyeing of the desired depth to be obtained. Certain dyes may require an assistant to improve their solubility. It may be advisable to apply the dyes from a heated impregnating liquor to increase their solubility. There is neither swelling of the fiber nor true absorption of the dye in the impregnating bath. Nonionic wetting and dispersing agents are not needed at this stage but it is convenient to add a suitable agent in sufficient quantity to insure that the exact amount is carried over to the acid bath to bring about optimum fixation.

The acid bath is set with about 1 g. sulfuric acid (168° Tw.) per liter and heated to the boil. In some cases sulfuric acid may be replaced by another acid and the bath may also contain buffer salts of the acids employed as well as the nonionic agent. The duration of the acid treatment depends on the dye, the depth to be dyed, the quality of the wool, and the composition of the bath.

In the boiling acid bath the dye is very quickly absorbed by the fiber. A certain amount of dye bleeds into the acid bath until a well-defined equilibrium is established between the dye concentration on the fiber and in the bath. This amount of dye was found to be dependent only on the dye used, its concentration in the impregnating liquor, and the composition of the boiling acid bath. By adding a determined amount of dye to the acid bath before starting the dyeing process, continuous dyeing can be executed without any change of shade throughout the whole run. Provided the temperature of the acid bath as well as that of the impregnating liquor is kept constant, no variation in shade will occur, because the uptake in the impregnating liquor is merely mechanical. Yet in the acid bath a very low liquor-goods ratio permits equilibrium to be reached within a few minutes, even if the initial dye addition in the acid bath—for instance, when dyeing mixtures—has not been made properly.

Experiments were carried out with a number of acid dyes of different types and behavior as a result of which it can be stated that the suitability of an acid dye for application on wool by a continuous dyeing method, both as a self shade and in combinations, depends upon the following factors:

The time required to reach equilibrium, which is a function of the speed of reaction;

The ratio of the concentration of dye fixed on the fiber and that in the acid bath at equilibrium, which for given dyeing conditions, is a constant;

The levelling properties of the dye under optimum conditions of pH and salt content of the acid bath;

The use of a nonionic agent in the acid bath; and

Liquor circulation in the acid bath.

Satisfactory results were also obtained with chrome dyes and the ester salts of leuco vat dyes. Experiments have not yet reached a stage, however, which would permit a final judgment. When applied by the method used for acid dyes, the time required for dyeing had to be doubled to allow for developing after impregnating and fixing. Sodium dichromate was used to form the chromium lake and to oxidize the leuco compound.

The work described above was done on a laboratory scale and the application of the method to long runs must await construction of appropriate machinery. Collaboration with machinery manufacturers in the design of a machine capable of treating the material for a sufficiently long time at a fairly low liquor:goods ratio and securing an abundant flow of liquor through the goods is necessary.

(Continued on Page 803)

Proceedings of the
American Association of Textile Chemists and Colorists

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October 31, 1949

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28TH NATIONAL CONVENTION

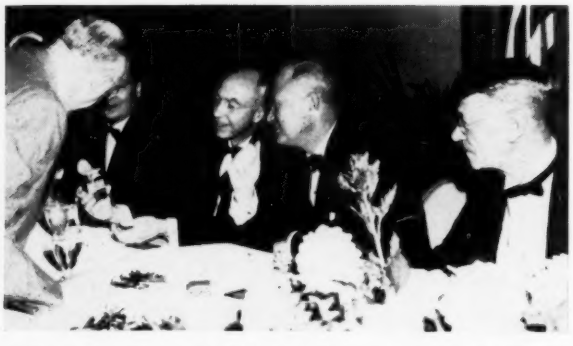
THERE were approximately 1,800 in attendance at the 28th National Convention, held at Chalfonte-Haddon Hall, Atlantic City, on October 13th, 14th and 15th. Under the chairmanship of Walter F. Fancourt, III, the Philadelphia Section, as host for the Convention, had spared neither time, money nor effort to provide one of the most successful meetings in the Association's history.

Many were present on Wednesday the 12th and attended a preview of the exhibits held that evening. The exhibits represented the most ambitious display ever attempted by the Association and held the attention of all throughout the three-day period. Much time and effort had gone into the preparation of the individual booths and the whole presented an unusually attractive and informative show. A number of photos of the exhibits will be published in future issues.

The registration desk was open Wednesday evening also for those who wished to register in advance and was the scene of a smooth-functioning activity for the next three days.

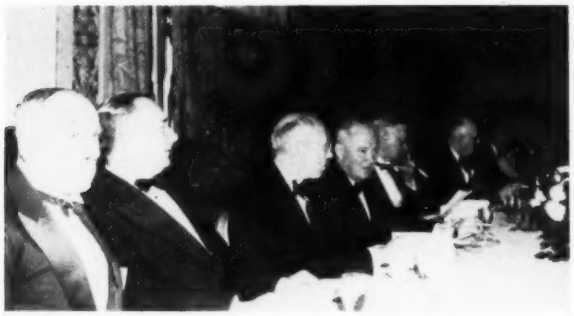
The National Council meeting was held Thursday morning, and Thursday afternoon the General Technical Session was held with Arthur W. Etchells presiding. This was followed by the Annual Business Meeting under the direction of Henry F. Herrmann. The Olney Medal Award dinner was held Thursday evening with George H. Schuler presiding. Walter F. Fancourt welcomed the members and was followed by Leonard S. Little and J. Robert Bonnar who discussed the corporate membership and general research programs. Mr. Schuler spoke on "The Medalist—The Man" and Dr. Pauline Beery Mack on "The Medalist—The Scientist." The Olney Medal was presented to Charles A. Seibert by President Herrmann after which Mr. Seibert responded. Others seated at the head table, in addition to the speakers, were: Dr. Carl Z. Draves, Past President, Arthur W. Etchells, National Chairman of the Technical Program Committee, William D. Appel, Past President, Thomas R. Smith, Past President, P. J. Wood, Past President, Dr. H. C. Chapin, National Secretary, John N. Dalton, National Vice-President, C. Norris Rabold, National Vice-President, William R. Moorhouse, National Treasurer, Dr. Harold W. Stiegler, National Director of Research, James Dixon, Philadelphia Sec-

Left to right—Henry F. Herrmann, National President, C. Norris Rabold, National Vice-President, Walter F. Fancourt, III, General Convention Chairman, Ernest H. Rettberg, Jr., General Convention Vice-Chairman.

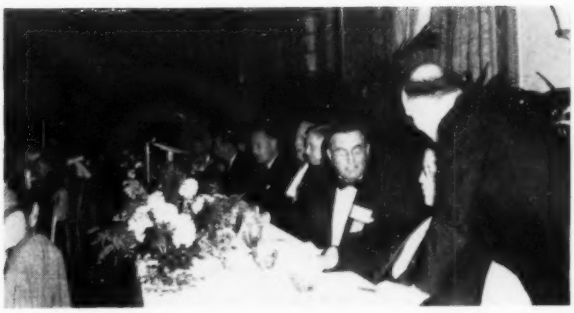


Arthur Thompson Entertains a Group of Past Presidents With Card Tricks.

A View in the Press Room.



Three Views of the Head Table at the Olney Award Dinner.



tion Chairman, William H. Cady, Past President, Percival Theel, National Chairman of the Publications Committee, and Paul J. Luck, National Chairman of the Publicity Committee.

On the Friday schedule was a breakfast meeting of the Corporate Membership Committee with the Noncellulosic Group Meeting and the Auxiliaries and Testing Group Meeting both held in the morning. Henry E. Millson presided at the first group meeting and Dr. Milton Harris at the second. The Intersectional Contest was held in the afternoon with Patrick J. Kennedy, National Chairman of the Contest Committee, presiding.

A breakfast meeting of the Executive Committee on Research was held Saturday morning. Two group meetings were also held: the Cellulosic Group Meeting with Dr. Arnold L. Lippert presiding and the Hosiery Group Meeting with Virgil T. Hartquist presiding. The Annual Banquet was held on Saturday evening with James Dixon, Chairman of the Philadelphia Section, presiding as Toastmaster. Mr. Fancourt thanked all who had contributed to the success of the meeting. Patrick J. Kennedy announced the winners of the Intersectional Contest as follows:

First Prize—Rhode Island Section.

Second Prize—Northern New England Section.

Third Prize—Piedmont Section.

Mr. Herrmann presented his farewell address as President. He retires from office on January 1st after three terms as head of the Association. P. J. Wood, Past President, presented the Past President's pin to

P. J. Wood (right) Presents Past President's Pin to Henry F. Herrmann at Annual Banquet.

A Group at the Preview of the Exhibits: Mrs. Walter F. Fancourt III, Member of Ladies' Committee, Richard L. Jones, Chairman of Ladies' Committee, James P. Conaway, Chairman of Transportation Committee, Mrs. A. E. Raimo, Member of Ladies' Committee, and A. E. Raimo, Chairman of Registration Committee.

President Herrmann Congratulates Charles A. Seibert, 1949 Olney Medalist.

Mr. Herrmann. The main address of the evening was given by Morris Sayer, Chairman of the Board of the National Association of Manufacturers. George H. Wood, General Chairman for the 1950 Convention, reported that work is already under way for the meeting which will be held at Wentworth - by - the - Sea, Portsmouth, New Hampshire, September 28-30, 1950. Others seated at the head table, in addition to the speakers, were Charles A. Seibert, 1949 Olney Medalist, Kenneth H. Barnard, National Chairman of Conventions, Thomas R. Smith, J. Robert Bonnar, National Chairman of the Research Committee, C. Norris Rabold, William R. Moorhouse, Dr. Harold C. Chapin, Dr. Harold W. Stiegler and Dr. Carl Z. Draves.

Entertainment by The Eight Ambassadors, The Harpettes and Jean Carroll followed the banquet after which there was dancing.

Ladies attending the Convention reported that an enjoyable program of special entertainment had been provided for them and were well pleased with the efforts that had been made.

Beginning with this issue all papers will be published in the Proceedings.

Following are the Convention Committee Chairmen and Co-Chairmen representing the Philadelphia Section:

General Chairman—Walter F. Fancourt, III

Vice-Chairman—Ernest H. Rettberg, Jr.

Banquet—Al H. Seitz, Chairman
John W. Barton, Co-Chairman

Entertainment—John W. Jordan, Chairman
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Reception—Charles A. Seibert, Chairman
Arthur M. Gordon, Co-Chairman

Dr. Pauline Beery Mack Speaking on "The Medalist—The Scientist."

Group Welcomes Morris Sayre at Atlantic City Station: James Dixon, Walter F. Fancourt, III, Mr. Sayre, C. Norris Rabold.

Walter F. Fancourt Welcomes the 28th National Convention.

Henry F. Herrmann, National President and C. Norris Rabold, National Vice-President and Nominee for President for 1950.

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Thomas H. Hart, Co-Chairman
Technical Program—William O. Neeb, Chairman
John Linton, III, Co-Chairman
Transportation—James P. Conaway, Chairman
John J. Tomalino, Co-Chairman

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Report of Western New England Section

THE first 1949 Fall meeting was held on Friday, September 23rd, at the Waverly Inn, Cheshire, Connecticut. Andre Blumenthal, Vice-president and Assistant General Manager of Sidney Blumenthal & Co., Inc. addressed an audience of 42 members and guests on management's viewpoint on textile research.

Officers for the calendar year 1950 were elected in a business session following the technical portion of the program. New officers are as follows:

Chairman—J. Edward Lynn, American Cyanamid Company, Stamford, Connecticut.
Vice-Chairman—Raymond J. Carey, General Dyestuff Corporation, New York, New York.
Treasurer—Robert N. Brownlee, U. S. Rubber Company, Naugatuck, Connecticut.
Secretary—Arthur S. Nyquist, American Cyanamid Company, Stamford, Connecticut.
Councilor—Harold H. Taylor, Sidney Blumenthal Company, Shelton, Connecticut.
Sectional Committee—S. V. Vaniotis, Sidney Blumenthal & Company, Shelton, Conn., John M. Hood, American Cyanamid Company, Stamford, Conn., Joseph F. Melody, Norwalk Hat Company, Norwalk, Conn., and O. Edelstein, The Pond Lily Company, New Haven, Conn.

Respectfully submitted,
EDWARD A. MURRAY,
Secretary

—♦ ♦—

Report of N. C. State Student Chapter

ON September 29, 1949, the North Carolina State College Student Chapter held its first meeting of the year to outline the Fall program of speakers and social activities.

Reynolds Carnevale, our chairman for this year, started the meeting by welcoming thirty-four new applicants and introducing them to the Chapter. The main speaker was the head of the Chemistry and Dyeing Department of N. C. State College, Professor Henry A. Rutherford, who gave a short talk on the background of the A.A.T.C.C., its functions and importance in the textile world, and the place of the Student Chapter in the organization as a whole.

A regular meeting schedule was announced, commencing October 6, 1949, with Arthur R. Thompson of Ciba Company, N. C., as the first speaker.

The meeting ended with the appointment by the Chair of a Social Committee to take care of the Chapter's social activities.

Respectfully submitted,
E. H. ASPINWALL, JR.,
Secretary

Report of Fall Meeting Mid-West Section

THE fall meeting of the Mid-West Section was held at the Bismarck Hotel, Chicago, Illinois, on September 24, 1949.

The afternoon meeting was called to order at 2:45 P. M. by the vice-chairman. Approximately 65 members and guests attended. After several announcements, Dr. Leonard J. Armstrong of Armour & Co., was introduced. Dr. Armstrong presented a very informative paper concerning the products supplied by the packing industry and used in textile processing. The meeting was then opened to general discussion.

Dinner was served at 7:30 P. M. and 85 members and guests were present.

The secretary's and treasurer's reports were read and accepted. Clarence Wille then reported for the Intersectional Committee concerning the paper to be presented during the National Convention, after which the chairman introduced several members of other sections, who were guests.

The report of the nominating committee was then read by Al Feit and included the following nominations:

Chairman—Elliott Morrill
Vice Chairman—Leonard J. Armstrong
Treasurer—Tom Latham
Secretary—John Schroder
Councilors—Joseph H. Jones
Ludwig Hilger
Sectional Committee—Al Olson
Kirk Ferguson
J. MacNamara
Bill Boyd

The motion was made, seconded, and approved that the secretary cast a unanimous ballot for those named by this committee.

Robert H. Nuttall of American Aniline Products, Inc., presented a paper on the "Fast Coloring Obtainable with Naphthols and Vat Dyestuffs." His talk was augmented by a display of several sample dyeings.

It was announced, with regret, that Gordon Markel, Councilor, was leaving the section.

Respectfully submitted,
WM. BOYD
Secretary

Intersectional Contest —

FACTORS INFLUENCING CROCKFASTNESS OF PACKAGE-DYED NAPHTHOL COTTON YARNS*

SOUTH CENTRAL SECTION

Committee
W. F. Luther, *Chairman*
W. G. Agnew
H. H. Eagar, Jr.
O. T. Lankford
H. A. Webb
Homer Whelchel

IT is now generally recognized by package dyers of cotton yarns that improvement must be made in the crockfastenss of most package-dyed naphthol yarns in order to meet the insistence of the knitting trade for a higher level of crockfastness than that generally offered and accepted before the war. For instance, A. F. Williams writing in 1934 in the AMERICAN DYESTUFF REPORTER made the statement "—fastness of rubbing of naphthol AS dyeings has progressed so that today the problem can be considered to have been solved—." Since several of the package dyers in the South Central section have keenly realized that they can not make such a statement on their part today, it was considered that a systematic and scientific study of the factors influencing crockfastness would be an appropriate subject for an Intersectional Contest Paper.

Due to the limitation of time and to the immensity of the field, especially if the whole range of naphthols be considered, it was decided that it would be better to limit the number of dyes studied and to consider as many as possible of the factors involved in a typical naphthol package dyeing procedure. In line with this, the present paper has been limited to a study of 2% dyeings of Naphthol ASSW developed with 2% KB base and 7% RN salt.

By limiting the dye formulas considered, it was, of course, realized that the application of any principles discovered in the course of the investigation, to naphthol dyeing in general, would in turn be limited. This would be true especially for naphtholation. On the other hand, for factors such as yarn preparation, soaping and softening, the same knowledge would more likely apply. Therefore, it is especially important to the reader of this paper that he keep these facts in mind when thinking of package naphthol dyeing in general. It is the hope of this committee to continue the investigation of the subject of this paper with a consideration of other naphthol dyestuffs and other factors.

In order to have a basis of comparison for the many dyeings made during the course of the investigation, so-called standard dyeing procedures were set up for both the KB base and RN salt dyeings. No claim is made that the following outlined procedures were thought to be the best methods at the time. Rather, they were worked out as representing good conditions that all three participating companies felt they could follow. Suffice it to say here that many packages were dyed, many hours were spent and much knowledge was gained before matches were obtained between the participating companies.

Standard Dyeing Procedure for Naphthol ASSW with KB Base

1. Wind yarn to get uniform density packages.

2. Bleach with 3% of hydrogen peroxide and sodium silicate on the weight of the yarn for 2 hours.

3. Spring the dye bath with 0.15% sulfonated castor, 0.02% Metasol (sodium hexa-metaphosphate) and 0.33% caustic soda (bath basis).

4. Circulate bath each way for 5 minutes starting at 110°F, and then add Naphthol ASSW (2% on the weight of yarn) which has been pasted with twice its weight of alcohol and equal its weight of 25% caustic soda solution.

5. Circulate 20 minutes switching pump every 5 minutes.

6. Add anhydrous Glauber's salt (15% by weight of yarn) and circulate 30 minutes switching pump every 5 minutes.

7. Drain and give 2 ten-minute rinses with anhydrous Glauber's salt (30% on weight of yarn).

8. Prepare KB base solution as follows: Fast Red KB (2% on weight of yarn) is pasted up with 0.1% Diazonpon AN and boiling water (1½ gal./lb. of base). Hydrochloric acid (1 pint/lb. of base) is added slowly with stirring. The base mixture is poured into a can containing ice and cold water (1½ gal./lb. of base) and stirred. This is then made up to 3 gal./lb. base (keeping temperature below 55°F.) and sodium nitrite 0.4 lb./lb. base) dissolved in water (1 pint /lb. of base) is added slowly with stirring. Allow 20 minutes for diazotization. Finally, add anhydrous sodium acetate (½ lb. /lb. base) with stirring and test for completeness of reaction.

9. Close drain valve, add Glauber's salt (20% on weight of yarn), KB base solution, acetic acid (1 lb. /lb. KB base), fill with water below 85°F. and run for 30 minutes switching pump every 5 minutes.

10. Drain and rinse 3 times with cold water for 10 minutes each.

11. Soap at 130°F. for 20 minutes with a solution of 88% neutral soap (4% on weight of yarn) and soda ash (2% on weight of yarn) which have been boiled together previously.

12. Repeat (11) at 190°F.

* Presented at Intersectional Contest, Atlantic City Convention, October 14, 1949.

13. Rinse 3 times at 160°F. for 10 minutes.

14. Dry.

Standard Dyeing Procedure for Naphthol ASSW with RN Salt

1. Use the same procedure for preparing the yarn and naptholating as for KB base through Part 7.

2. RN salt is dissolved in water (1 lb. /gal.).

3. Close drain valve, add Glauber's salt (20% on the weight of the yarn), RN salt solution, acetic acid (1 qt. /100 gal. bath), fill with water below 85°F. and run for 30 minutes switching pump every 5 minutes.

4. Drain and finish in the same manner as described for KB dyeing from Part 10 through drying.

The following principal dyeing operations have been considered in this paper as to their influence on crockfastness:

A. Yarn preparation.
B. Naphtholation.
C. Developing.
D. Soaping.
E. Softening.

All the dyeings were made on 30/2 combed mercerized cotton yarn. Most all of the results recorded in this paper have been observed or checked in triplicate; i.e. by each of the three co-operating companies. Triplication of work in these cases was considered justified since such a confirmation of results was held to be valuable in a field where so many differences of opinion have at times prevailed.

The crockfastness of the yarn on the test packages was determined according to the standard A.A.T.C.C. test method "Colorfastness to Rubbing." The No. 4 wash test under standard A.A.T.C.C. test method "Colorfastness to Commercial Laundering and to Domestic Washing" was also used to check a number of samples since the committee felt that a sizable percentage of customer complaints on naphthol washfastness is due to the rubbing obtained under these conditions. In general it was found that there was good correlation between the results obtained by the two methods. Yarn from the outside, middle and inside of the test packages was knit to give fabrics for crockfastness evaluations.

A. Yarn Preparation

In order to test for the effect of yarn preparation upon crocking, three typical methods of yarn preparation before dyeing were considered.

1. Simple wet-out—Defined as wetting out in a bath containing a wetting agent such as Pine Solvent XX for 20 minutes at 140°F.

2. Thorough Scour—Defined as circulating a bath containing 2% soda ash and a wetting agent such as Pine Solvent XX for 45 minutes at 180°F.

3. Bleach Base—Defined as bleached with 3% hydrogen peroxide and sodium silicate at 120-180°F. for 2 hours.

Rubbing tests showed that:

A. Yarn dyed after a thorough scour gave less crocking than yarn dyed after a simple wet-out.

B. Yarn dyed after a bleached base gave distinctly less crocking than yarn dyed after a thorough scour.

Under this heading was also considered the effect of:

C. Using yarn from different sources.

D. Using packages of uneven density.

In connection with (C), packages of 30/2 combed mercerized yarn from three different spinners and mercerizers were dyed at the same time by each company. No apparent difference was noted in the crockfastness of fabrics from any of the packages.

In connection with (D), packages of uneven density were deliberately made and selected for simultaneous dyeing. In another test dyeing, packages consisting of yarn wound both upon a Franklin spring and upon a rigid perforated tube were mixed and dyed simultaneously. Considerable variation in both the depth of shade and the amount of crocking was observed between packages; also between the outside and inside portions of the same package.

B. Manner of Naphtholation

In general the work under this heading has shown that proper naphtholation is necessary for good level dyeing and that such a dyeing will produce yarn of good crockfastness. Too much importance cannot be attached to this operation since the best conditions applicable after this operation will not clear up crocking caused by an improper procedure here. As a result of work done by this committee the following specific comments and suggestions are made as bearing on the naphtholation process.

(a) PREPARATION OF THE NAPHTHOL SOLUTION.—Most of the dyeings for this paper were made by using a naphthol solution prepared by the cold method. However, the cold method was compared with the hot method by making a number of comparison dyeings. The results showed that a slightly lower color value was obtained by the hot method and that the crocking of the yarn was just as great if not somewhat greater.

One of the strongest opinions formed by the committee out of the work for this paper is that a large percentage of faulty naphthol dyeings including sticky yarn, harsh yarn hard to knit or sew, low color value, etc., is due to improper preparation of the naphthol solution in which either insoluble naphthol is left or else insoluble naphthol is precipitated when the solution is added to the dyebath. It was found by experiment that the amount of insoluble naphthol required to produce dyed yarn of inferior quality need be only a very small percentage of the total in solution. Such a condition may be obtained by one or more of several different ways.

Alcohol: The amount of alcohol used to paste the Naphthol ASSW in the standard procedure as outlined above, i.e. 2 to 1 by weight, is believed to be too small and should be increased to 3 to 1. Although it was found possible to dissolve the naphthol with this amount of alcohol when caustic soda was added; it was found that quite frequently some of the naphthol precipitated when poured into the dyebath and that this condition was considerably alleviated when the alcohol content was increased.

Caustic Soda: Laboratory experiments were carried out to show that a solution of greater stability is obtained if an equal weight of 33% caustic solution be added to the Naphthol ASSW instead of an equal weight of 25% caustic soda.

Filtration: It is believed that it would be good practice to filter all naphthol solutions through a fine filter cloth just as they are being added to the dyebath. Experiment shows that frequently an appreciable amount of insoluble material goes into the dyebath even with the most favorable dissolving conditions. This may be due to insoluble naphthol that separates on the sidewall of the dissolving tank as the alcohol evaporates, to insoluble matter in the original naphthol dyestuff or other reagents going into the makeup bath.

(b) NAPHTHOLATION TEMPERATURE.—Several dyeings were made at different temperatures to show that there is an optimum naphtholation temperature for best color value and best crockfastness. This temperature appears to be approximately 100°F. for Naphthol ASSW. Naphtholations were made starting the bath at 80°, 100°, 110°, 120°, and 140° F. There was a gradual decrease in color value and crockfastness as the naphtholation temperature increased or decreased from the 110°F. optimum.

(c) SALT REQUIREMENTS.—Indications are that the amount of salt required to exhaust the naphthol from the naphtholating bath is much lower than that which is ordinarily used, and that

a high salt concentration leads to increased crocking.

The effect of varying the salt concentration was tested by making the following dyeings.

1. Naphtholation for 1 hour with no salt.
2. 15% Glauber's salt added as in the standard procedure.
3. 25% Glauber's salt added as in the standard procedure.
4. 25% Glauber's salt added in 5% steps every 5 minutes.
5. 40% Glauber's salt added in 8% steps every 5 minutes.

The results showed that the dyeings with (1) and (2) were more level and of better crockfastness. The crocking of the No. 5 dyeings were appreciably worse than the other dyeings. No difference was noted between dyeings No. 3 and No. 4.

(d) RINSING AFTER NAPHTHOLATION.—In order to test the hypothesis that certain rinses after naphtholation might remove the surface naphthol solution or solids that cause the formation of a surface lake during the developing reaction, several dyeings were made in which rinses were given after naphtholation with:

1. Plain water.
2. 25% common salt.
3. Surface active detergents.
4. 5% alcohol and 0.1% caustic soda.

Results showed that the effect on dyeings No. 1 and No. 2 were not apparent. There was some loss in color value with No. 3 and no apparent increase in crockfastness. The crockfastness obtained with dyeing No. 4 was somewhat improved but there was a slight decrease in color value.

(e) ADDITION TO THE NAPHTHOLATING BATH.—*1. Sulfonated Castor.*—Sulfonated castor is still widely used as an addition to the naphtholating bath and it will be recalled that the use of 0.15% was stipulated in the standard dyeing procedure previously outlined. Dyeings were made in which the sulfonated castor was omitted and it was found that the crockfastness was improved thereby.

The use of sulfonated castor should be questioned from another standpoint since it is quite possible that the "sticky" condition of some yarns is caused by the "precipitating effect" on the castor caused by the salt added to the naphtholating bath.

2. Formaldehyde.—The use of formaldehyde (1% on the weight of the yarn) was tried but it was found to have no apparent effect on either the shade or crockfastness.

C. Manner of Developing

The usual precautions followed in making up the base and salt have been found to be necessary.

The effect of varying the acetic acid concentration in the developing bath with KB dyeings was studied by making the following dyeings.

1. 0.5 lb. of 56% acetic acid per lb. of KB base.
2. 1.0 lb. of 56% acetic acid per lb. of KB base.
3. 2.0 lb. of 56% acetic acid per lb. of KB base.
4. 2.0 lb. of 56% acetic acid per lb. of KB base plus 0.2% of caustic soda in the salt rinses.

The results showed little, if any, difference in the crockfastness of any of the dyeings. Dyeings No. 1 and No. 4 were somewhat weaker in shade than the other dyeing however.

The effect of the addition of sequestering agents and surface active detergents to the developing bath was studied by making several test dyeings. No effect was found as to shade or crockfastness with any of the agents tested.

D. Soaping

The use of soap and synthetic detergents both by themselves and in combination were studied by comparative tests.

1. By making crock tests on yarn before and after the standard soaping procedure it was established that there was some improvement obtained in crockfastness by the soaping-off operation.

2. A comparison of yarn soaped before and after drying showed that there was better crockfastness obtained by soaping before drying.

3. There was found to be little improvement in crockfastness obtained by increasing the number of soap baths beyond two.

4. There was found to be little difference in the crockfastness of yarn soaped at 120° or at 190°F.

5. Of the synthetic detergents tried by themselves, none showed any improvement over soap alone. Some improvement was noted when synthetic detergents of the type such as Stabilon were used along with soap in the second soap bath. More work is planned to check these results.

6. The addition of carboxymethylcellulose to the soaping baths was not found to improve the crockfastness over that obtained with soap alone.

7. The addition of 1% sodium lignosulfonate, such as Marasperse N, to the soap baths was found to improve the crockfastness somewhat. Again more work is planned to check on these results.

E. Softening

A comparison was made of the nonionic type of softener such as stearic acid and/or certain soluble oils with an anionic type of softener such as Achovel E. A definite improvement in crockfastness was noted with the use of the anionic type of softener. This very interesting fact deserves better checking.

No comparison was made with any cationic type of softener since it is impossible to apply them uniformly to yarn in package form due to their strong substantivity.

Acknowledgment

Acknowledgment is made to R. H. Nuttall of American Aniline Products, Inc., for certain helpful suggestions in correspondence.

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Piedmont Section to Meet Nov. 5

THE Fall Meeting of the Piedmont Section will be held at the Hotel Charlotte, Charlotte, N. C., on November 5, 1949.

The Technical Session will convene on Saturday afternoon at 3:00 P.M. at which time Warren Beaumont of the Research Laboratories of Arnold, Hoffman Company will speak on "The Fixation of Direct Dyestuffs." This is a very timely subject and should prove interesting. Kit Carson with the Riegel Textile Corporation will officiate at this gathering.

The Banquet will be served at 7:00 P.M. in the Ballroom. The speaker of the evening will be Dr. Heaton, Pastor of the Myers Park Baptist Church. The title of his talk "New Factors in Labor Relations" indicates a subject of utmost importance in our present time.

All room reservations should be made direct with the Hotel Charlotte.

Tickets for the Banquet will be on sale in the Hotel Lobby under the supervision of the Treasurer, R. Hobart Souther, Cone Mills Corporation, Greensboro, N. C.

W. Chester Cobb of Arnold, Hoffman Company, is in charge of meeting arrangements.

The Piedmont Section now rates third in size with 659 members and as of the first of next year an additional Councilor will be added to bring the total to four.

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R. I. Section to Meet Nov. 18

THE Rhode Island Section will hold a dinner meeting on November 18th.

Rabold Addresses Joint Meeting, Southeastern Section and Georgia Student Chapter

C. NORRIS RABOLD, National Vice-President, was the principal speaker at the banquet session of a joint meeting of the Southeastern Section and the Georgia Institute of Technology Student Chapter on October 1st. The meeting was held in the Harrison Hightower Textile Engineering Building of the A. French Textile School.

Mr. Rabold discussed the student chapters of the Association, pointing out that there were now student chapters at the following schools:

Lowell Textile Institute.
North Carolina State College.
Philadelphia Textile Institute.
New Bedford Textile Institute.
Georgia Institute of Technology.
Clemson College.
Bradford Durfee Technical Institute.
Utica Technical Institute.

The oldest chapter is the one at Lowell which was founded in 1923 and the youngest is at Utica, founded this year. The total student membership is now 283, representing a steady growth.

Mr. Rabold emphasized the need of cooperation between local sections and the student chapters in their area so as to make possible the personal contacts which are so desirable in an organization of this type. He suggested that this could be accomplished by having more combined meetings, having the students make the arrangements for the meeting, encouraging the attendance of students at section meetings by providing transportation, lowering charges, etc., and having the student chapters invite section members as speakers.

Mr. Rabold indicated that where sections are financially able scholarships might be established which would aid both the students and the section.

Resolution Presented

Mr. Rabold presented the following resolution, adopted at the Council meeting on September 9th, to Professor C. A. Jones:

"To Charles Alfred Jones, Professor of Textiles, Georgia Institute of Technology, Atlanta, Georgia, the Council of the American Association of Textile Chemists and Colorists, meeting in New York on September 9th, 1949, extends its greetings and its appreciation of his many years devotion to the highest aims of our organization. Among the founders of our Southeastern Section, he has served as Secretary, Chairman and Councilor. To him the Student Chapter of the Georgia Institute of Technology has looked for guidance. May his influence long be felt in the affairs of our Association."

The technical session in the afternoon featured a paper by Dr. George L. Royer of the Physical Chemical Division, Calco Chemical Division, American Cyanamid Company, Bound Brook, New Jersey, on "Some Scientific Aspects of Dyeing".

A large number of members and guests were present for the meetings and also inspected the new Harrison Hightower Building.

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Research Highlights

FLAMMABILITY OF FABRICS—Because of the many variations in weaves and weights and particularly because of these factors in pile and tufted fabrics, the A.A.T.C.C. test instrument is being restudied at Lowell by the Research Group. It is expected that the final design will satisfy all test requirements.

WATER REPELLENCY — Extensive evaluation of the Rain Tester has led to improvements in design and accessories which makes the instrument more precise.

LIGHT FASTNESS — Although the Fade-Ometer calibration papers have definitely proved to be useful in routine applications since their distribution by the National Bureau of Standards, further development is continuing to make the next batch even more useful.

NEW COMMITTEE—A new committee on The Evaluation of the Effectiveness of Enzymes for Desizing has been organized and started work.

WASH FASTNESS—The new accessories for the Launder-Ometer have worked so well that more sets are being made so that further interlaboratory tests may be conducted.

DETERGENCY COMPARATOR—This new instrument is ready for announcement. Mill use demonstrates its value in studying detergency conditions. Results can be translated to the larger equipment with faithful reproduction.

VISITOR TO A.A.T.C.C. LABORATORIES — Paul Buron Labbe, Institute Sanitas y Anilinas, South America, Santiago de Chile, visited the A.A.T.C.C. Laboratories to discuss standard methods and tests, particularly standard soils.

His interest is in standard methods most commonly used by other countries.

Report of Philadelphia Section

A MEETING of the Philadelphia Section was held on September 16th in the English Room of Kugler's Restaurant in Philadelphia.

Vice Chairman Richard B. Stehle was in charge of the meeting in the absence of Chairman James Dixon. Following a short business meeting, during which the various committee chairmen reported on their activities, Vice-Chairman Stehle presented the Rev. Clarence R. Rahn of Temple, Pa., as the after dinner speaker. He spoke on "The Wit and Humor of the Pennsylvania Dutch."

Arthur W. Etchells reported as Chairman of the Nominating Committee for the 1950 officers.

145 members and guests attended the dinner preceding the meeting while 170 attended the meeting and technical session.

Since no one exercised rights to add additional nominees within 10 days of the meeting as permitted under the new By-Laws of the Philadelphia Section, Walter Hamlem, Jr. (of DuPont Co.), Chairman of Tellers, has declared that those senior members selected by the Nominating Committee have been elected officers of the Section for the calender year of 1950.

These include the following:

Chairman Emeritus—Elmer C. Bertolet
Chairman—Richard B. Stehle
Vice-Chairman—A. E. Raimo
Treasurer—Edward C. Diehl
Secretary—Thomas H. Hart.

Sectional Committee—John W. Barton
John W. Jordan
Harry L. Morgan
Ernest Rettberg

Councilors—Walter F. Fancourt, 3rd
Dr. Onslow B. Hager
M. H. Klein,
Frederick V. Traut,
James Dixon
Jackson A. Woodruff

Respectfully submitted;
THOMAS H. HART
Secretary

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Philadelphia Section Meetings

THE Philadelphia Section will meet on January 13th, 1950 at Kugler's Restaurant in Philadelphia. The balance of the Section meeting dates for 1950 will appear as they are approved by the new 1950 officers.

Membership Applications

SENIOR

Clarence F. Belcher—Research Chemist, E. I. duPont de Nemours & Co., Inc., Wilmington, Del. Sponsors: J. W. Killheffer, C. A. Sylvester.

Earle O. Bryant—Director of Applied Research, Ecusta Paper Corp., Pisgah Forest, N. C. Sponsors: H. B. Constable, R. D. Sloan.

Natalina Cavinato—Lab. Asst., General Dyestuff Corp., New York, N. Y. Sponsors: C. Z. Draves, H. Luttringhaus.

Richard G. Cooper—Sales Repres., Tennessee Eastman Corp., Kingsport, Tenn. Sponsors: W. L. Hicks, D. G. Carmichael.

James S. Crist—Asst. Hosiery Dyer, Union Mfg. Co., Frederick, Md. Sponsors: E. W. Peters, A. C. Mackey.

Ethelwyn M. Dodson—Specialist in Clothing, Univ. of California, Berkeley, Calif. Sponsors: C. W. Dorn, J. R. Bonnar.

Abraham Fleischman—Yarn Dyer, Interstate Rayon Yarns Corp., North Bergen, N. J. Sponsors: W. Ferrazano, L. H. Winnell.

Marshall J. Gardner—Supt., Print Works Plant, Cone Finishing Co., Cone Mills Corp., Greensboro, N. C. Sponsor: R. H. Souther.

Beato R. Gorini—Chief of Dyehouse, Fabrica de Tejidos Los Leones, Costa Rica. Sponsors: D. M. Musser, E. W. Peters.

Rowland N. Grauch—Executive, Unity Dyeing & Processing Co., Philadelphia, Pa. Sponsors: M. H. Klein, H. E. Rollins, Jr.

Max Grossman—Plant Supt., Charlomac Text. Screen Printing, Inc., Brooklyn, N. Y. Sponsors: C. Schoener, C. E. Post.

Edwin H. Johnson—Dyer & Finisher, S. Augstein & Co., College Point, L. I. Sponsors: D. P. Knowland, R. C. Allison.

Inez J. LaBossier—Extension Specialist in Clothing & Textiles, N. J. College of Agriculture, New Brunswick, N. J. Sponsors: C. W. Dorn, J. R. Bonnar.

William R. LaChapelle—Overseer of Dyeing, William Hollins, Inc., Forestdale, R. I. Sponsors: H. M. Gorton, Jr., E. A. Richards.

Fred E. Lademan—Text. Chemist, Cone Export & Commission Co., Inc., New York, N. Y. Sponsors: S. A. Pettus, L. R. Burgess.

Arthur F. Linden—Purchasing Agt., Delta Co., Philadelphia, Pa. Sponsors: J. P. Conaway, W. G. Hamlen, Jr.

John L. McConnell—Dyer, Matthews Woolen Mills Corp., Matthews, Ind. Sponsors: A. A. Barker, W. H. Wadsworth.

Richard T. McNamara—Package Dyer, Worcester Spinning & Finishing Co., Cherry Valley, Mass. Sponsors: C. G. Hard, R. W. Bower.

Elmer C. Merkle—Text. Research Chemist, Buffalo Electro-Chemical Co., Buffalo, N. Y. Sponsors: B. K. Easton, H. O. Kauffman.

George E. Motz—Indust. Chemical Sales, Nopco Chemical Co., Harrison, N. J. Sponsors: E. Mauldin, G. H. Small.

George M. Neville—Chem. Sales Engr., Atlantic Refining Co., Providence, R. I. Sponsors: H. Christison, L. Billings.

J. M. Newton—Director, Technical Sales Service, Clinton Industries, Inc., Clinton, Iowa. Sponsors: B. L. Estes, S. J. Davis.

Robert E. O'Neil—Dyer, Vassar Co., Chicago, Ill. Sponsors: L. Hoehn, Jr., F. H. Proudfoot.

Frank Perutz—Text. Engr., Continental Synthetic Textiles, Inc., New York, N. Y. Sponsors: F. G. LaPiana, G. N. Houth.

Hiag N. Piligian—Lab. Director, Marine Corps Depot of Supplies, Philadelphia, Pa. Sponsors: A. C. Mackey, E. W. Peters.

Ernst J. Rath—Consulting Chemist, General Dyestuff Corp., New York, N. Y. Sponsors: C. Z. Draves, L. Fusser.

Jack Reese—Salesman, E. F. Houghton & Co., Charlotte, N. C. Sponsors: J. Anderson, H. L. Blackwell.

John M. Roddy—Sr. Engr., Bigelow-Sanford Carpet Co., Inc., Thompsonville, Conn. Sponsors: T. E. Lyons, J. W. Young.

Dietrich Rottcher—Boss Dyer, The Narricot Co., Philadelphia, Pa. Sponsors: C. Thompson, E. R. Beigbeder.

Charles H. Schuettler—Salesman, Scholler Bros., Inc., Philadelphia, Pa. Sponsors: L. O. Koons, E. E. Rettberg, Jr.

Cornelius C. Smith—Chemist, Socony Vacuum Oil Co., Brooklyn, N. Y. Sponsors: R. B. Killingsworth, J. L. Burn, III.

Donald V. Speese—Tech. Sales Repres., Geigy Co., Inc., New York, N. Y. Sponsors: W. O. Neeb, J. C. H. Dempsey.

Oscar W. Stake—Supt. of Dyeing, Glenlyon Print Works, Phillipsdale, R. I. Sponsors: W. T. Clarke, R. M. Locke.

Harold C. Thompson—Colorist & Demonstrator, General Dyestuff Corp., New York. Sponsors: H. Luttringhaus, C. Z. Draves.

Sisto L. Vinci—Dyer, Peerless Finishing Corp., Paterson, N. J. Sponsors: L. J. Dogin, G. A. Moos.

Frank W. Ward, Jr.—Head Dyer, Richmond Piece Dye Works, Richmond, Va. Sponsors: E. R. Heintz, G. H. Alpers.

Charles P. Weber—Chg. of Nylon Dept., Richmond Piece Dye Works, Inc., Richmond, Va. Sponsors: B. C. Bond, H. F. Hoffmann.

Harold W. Wolf—Research Chemist, Forstmann Woolen Co., Passaic, N. J. Sponsors: W. Von Bergen, C. S. Clutz.

JUNIOR

Alfred C. Anderson—Salesman, Calco Chemical Div., American Cyanamid Co., Philadelphia, Pa. Sponsors: J. Dixon, T. J. Scanlon.

Joseph J. Benischeck—Research Chemist, Fred Whitaker Co., Inc., Philadelphia, Pa. Sponsors: J. Bauer, S. R. Miller.

George A. Caron—Dyer, Utica Knitting Co., Anniston, Ala. N. Johnston, J. A. Brittain.

John F. Cobianchi—Lab. Tech., Associated Dyeing & Printing Co. of N. J., Paterson, N. J. Sponsor: F. L. Bume.

Mario L. Fillippeli, Jr.—Tech. Repres., Onyx Oil & Chemical Co., Jersey City, N. J. Sponsors: D. M. Musser, L. P. Brick.

Heinrich Habig—Dept. Mgr., Heinrich Habig A.G., British Zone, Germany. Sponsors: C. Z. Draves, D. P. Sommer.

David I. Hall—Asst. to Dyer, Manhattan Yarn Dyeing & Bleaching Co., Brooklyn, N. Y. Sponsors: E. Shumsey, C. C. Knights.

Marvin E. Kaiser—Asst. Dyer, Phoenix Dye Works, Chicago, Ill. Sponsors: J. M. Jones, L. O. Meyer.

John M. McChesney, Jr.—Text. Chemical Mfg., Leatex Chemical Co., Philadelphia, Pa. Sponsors: J. F. Rieder, A. E. Raimo.

L. Kevin McChesney—Text. Chemical Mfg., Leatex Chemical Co., Philadelphia, Pa. Sponsors: J. F. Rieder, A. E. Raimo.

Robert A. McGurren—Lab. Asst., Pacific Mills, Lawrence, Mass. Sponsors: J. N. Dalton, J. P. Ploubides.

David A. E. Newman—Asst. Chemist, Antipyros Co., New York, N. Y. Sponsor: M. Gordon.

John J. Rourke—Color Matcher, Pacific Mills, Lawrence, Mass. Sponsors: J. N. Dalton, J. P. Ploubides.

Louis Russo—Apprentice Finisher, Assoc. Dyeing & Printing Co. of New Jersey, Paterson, N. J. Sponsor: F. L. Bume.

ASSOCIATE

Stanley Brooks—Chem. Engr., H. W. Butterworth & Sons Co., Providence, R. I.

Harry R. Chandler—President, Kennet Equipment & Machinery Co., Kennet Square, Pa.

Albert M. Foster—Exporter, Lawter & Co., New York, N. Y.

Norton C. Foster—Tech. Repres., Dow Corning Corp., New York, N. Y.

Henry H. Gilmann—Owner & Mgr., Resinous Chemical Mfg. Corp., Rutherford, N. J.

Robert A. Jaegers—Sales Repres., Standard Chemical Products, Inc., Hoboken, N. J.

Alice Linn—Extension Specialist in Clothing, Extension Service, U. S. Dept. of Agriculture, Washington, D. C.

Fred A. Stallings—Salesman, Procter & Gamble Dist. Co., Cincinnati, O.

Frank A. Taberski—Tech. Sales Repres., Wallerstein Co., Inc., New York, N. Y.

Ralph Woods—Sales Mgr., Fibre Specialty Mfg. Co., Philadelphia, Pa.

STUDENT

Ralph C. Andrews, Jr.—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Crawford O. Asbell—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Walter C. Blackstone, Jr.—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Guy R. Boleman, Jr.—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Irving L. Brand—Georgia Inst. of Technology. Sponsor: C. A. Jones.

John W. Casteen, Jr.—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Albert J. Chaiken—Georgia Inst. of Technology. Sponsor: C. A. Jones.

John L. Clarke—Georgia Inst. of Technology. Sponsor: C. A. Jones.

John E. Collins—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Tommy M. Cook—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Jones E. Copeland—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Horace E. Corley—Georgia Inst. of Technology. Sponsor: C. A. Jones.

John R. Davis, Jr.—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Horace B. Dowell—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Billy O. Fleming—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Isaac Franco—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Tom F. Griffin—Georgia Inst. of Technology. Sponsor: C. A. Jones.

William L. Hammond—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Philip G. Harris, Jr.—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Charles L. Henry, Jr.—Georgia Inst. of Technology. Sponsor. C. A. Jones.

Harold C. Herndon—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Siang L. Ho—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Charles C. Hulsey—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Joseph E. Johnston—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Troy A. Mays—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Zackry S. Norville—Georgia Inst. of Technology. Sponsor: C. A. Jones.

George S. Y. Poon—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Fred P. Powell, Jr.—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Xavier A. Rivera—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Ira G. Ross—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Hal A. Summers—Georgia Inst. of Technology. Sponsor: C. A. Jones.

J. Walden Taylor—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Charles H. Thompson—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Zaven S. Touloukian—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Matthew J. Yates—Georgia Inst. of Technology. Sponsor: C. A. Jones.

Frederick A. Covington—Lowell Textile Institute. Sponsor: E. E. Fickett.

Ruth E. Denio—Lowell Textile Institute. Sponsor: E. E. Fickett.

Martin I. Finkelstein—Lowell Textile Institute. Sponsor: E. E. Fickett.

Gerald M. Greenberg—Lowell Textile Institute. Sponsor: E. E. Fickett.

Walter J. Kosowicz—Lowell Textile Institute. Sponsor: E. E. Fickett.

James E. Miller—Lowell Textile Institute. Sponsor: E. E. Fickett.

Joseph D. Noonan—Lowell Textile Institute. Sponsor: E. E. Fickett.

Alfred J. Richard—Lowell Textile Institute. Sponsor: E. E. Fickett.

Henry J. Swiatek—Lowell Textile Institute. Sponsor: E. E. Fickett.

Jean L. Lacerte—St. Hyacinthe Textile School. Sponsor: G. R. Boule.

Rosaire Lapointe—St. Hyacinthe Textile School. Sponsor: G. R. Boule.

William E. Aldrich—Rhode Island School of Design. Sponsor: H. B. Sturtevant.

Stanley E. Berenberg—Rhode Island School of Design. Sponsor: H. B. Sturtevant.

Victor H. Koltun—Rhode Island School of Design. Sponsor: H. B. Sturtevant.

Theodore Dostanko—North Carolina State College. Sponsor: H. A. Rutherford.

Joseph J. Harand—North Carolina State College. Sponsor: H. A. Rutherford.

Leonard F. Catania—Philadelphia Textile Institute. Sponsor: P. Theel.

Applications for Transfer to Senior Membership:

Percy J. Fynn, David F. Lowry, Otto Adelsten Ofjord, John B. Patti, Milton J. Williams.

EMPLOYMENT REGISTER

This column is open for four insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. It is understood that these will be open to inspection by prospective employers, who can obtain further information from the Secretary.

49-23

Education: Textile High School, with college courses in chemistry.

Experience: Laboratory and plant technician.

Age 23; unmarried; references; vicinity of New York City preferred.

9-19, 10-3, 10-17, 10-31

49-24

Education: PhD, Switzerland.

Experience: Roller and screen printing of all fibers; finishing, including resins and anticrease treatment; superintendent, research chemist and chief chemist, abroad and in U.S. since 1942.

Age 45; married; references.

9-19, 10-3, 10-17, 10-31

49-25

Education: High school, Lowell Evening Textile School, Northeastern University Evening.

Experience: Textile Chemist and Analyst.

Age 23; unmarried; references; Lawrence-Boston area preferred.

10-3, 10-17, 10-31, 11-14

49-15

Education: Equivalent of U. S. college, with some graduate work; also 5 months in U. S. A.

Experience: 9 years; since 1945 as dyeing master in mill of 900 employees specializing in wool.

Age 32; married; references; citizen of Denmark seeking position in North America, particularly southwest U.S.A.

10-3, 10-17, 10-31, 11-14

49-26

Education: Textile institute graduate, chemistry, dyeing and finishing.

Experience: Operations, administration and laboratory, quality control and product development.

Age 32; married; references; New England preferred. 10-17, 10-31, 11-14, 11-28

49-27

Education: B. S. in Chemical Engineering.

Experience: Research Chemist and Bleachery Foreman.

Age 35; married; references.

10-17, 10-31, 11-14, 11-28

CALENDAR

HUDSON-MOHAWK SECTION
Meeting: November 18.

NEW YORK SECTION
Meetings: November 18 (Swiss Chalet, Rochelle Park, N. J.) Jan. 13 (Hotel New Yorker, New York), Mar. 3 (Hotel Statler, New York), April 7, May 5 (Kohler's Swiss Chalet, Rochelle Park, N. J.), June 16—Outing.

NORTHERN NEW ENGLAND SECTION
Meetings: November 4 (Lowell Textile Institute), December 2 (Hotel Vendome, Boston).

PHILADELPHIA SECTION
Meetings: November 11, January 13 (Kugler's, Philadelphia).

PIEDMONT SECTION
Meeting: November 5 (Charlotte Hotel, Charlotte, N. C.

RHODE ISLAND SECTION
Dinner meeting: November 18.

SOUTH CENTRAL SECTION
Meeting: November 19, (Hotel Patten, Chattanooga, Tenn.).

SOUTHEASTERN SECTION
Meeting: December 3 (At French Textile School, Georgia Institute of Technology).

WESTERN NEW ENGLAND SECTION
Meeting: November 4 (Rapp's Restaurant, Shelton, Conn.), December 9 (Danbury, Conn.)

COUNCIL
Meeting: January 13 (New Yorker, New York).

RESEARCH COMMITTEE
Meeting: January 13 (New Yorker, New York).

NATIONAL CONVENTIONS
1950: September 28 to 30, Portsmouth, N. H.
1951: October 18 to 20, Statler, New York
1952: Boston.

"Analytical Methods for a Textile Laboratory"

(A.A.T.C.C. Monograph No. 1)

CONTENTS:

General Instructions
Standard Solutions
Reagents
Methods of Sampling
Methods of Analysis of Chemicals
Determination of Finishing Materials
and
Determination of Resins and Resin Finishes
Identification of Dyestuffs on the Fiber
Determination of Textile Fibers
Useful Tables and Calculations

Dr. H. C. Chapin, Secretary, A.A.T.C.C.,
Lowell Textile Institute,
Lowell, Massachusetts

Dear Sir:

Enclosed is my check for $.....covering payment of.....copies of "Analytical Methods for a Textile Laboratory."

Name .....

Street Address.....

City..... Zone No..... State.....

This book of 287 pages, attractively bound, and well indexed, may be obtained from the Secretary, A.A.T.C.C., Lowell Textile Institute, Lowell, Mass., postpaid, for six dollars. To A.A.T.C.C. members, for one copy only, the price is five dollars.

For convenience in ordering, use coupon at left.

TRADE NOTES • NEW PRODUCTS

Main Building of the Philadelphia Textile Institute.

• PTI Formal Opening

More than 800 friends and alumni of the Philadelphia Textile Institute gathered on Thursday afternoon, October 6th, for the formal opening ceremonies of the new school at School House Lane and Henry Avenue, Germantown. The main building contains 90,000 square feet and was constructed at a cost of $1.050,000.

After an invocation by Dr. Robert T. Tumbelston of the Institute, Charles W. Carvin, opened the ceremonies.

Colonel Millard D. Brown, delivered a short address and was followed by Bertrand W. Hayward.

George M. Ewing, the Architect for the new buildings, then presented a key to the main building to Theodore B. Hayward, Chairman of the Foundation's Building Committee. This was followed by a presentation of a key to the Library which was turnaed over to George W. Walker and H. Heinbockel of the Edgar and Emily Hesslein Fund, Inc., New York.

A key to the Dye Laboratory was presented to Dr. Fred C. Scholler, after which the visitors were then shown through the new building and Library.

The new building is constructed of reinforced concrete, faced with Colonial brick, cast stone and marble. The building is two stories in the front and three stories in the rear, the ground floor opening on to Henry Avenue. Fluorescent lighting is used throughout the building and it is completely fireproof. Asphalt and acoustical tile are used extensively in the lobby and corridors, while the main lobby is decorated with Vermont and Georgia marble, so that this room may be used for textile fabric displays.

The physical testing laboratory on the second floor is air-conditioned. A cafeteria, recreation room, and lounges are included in the building. Green glass blackboards and yellow chalk are used throughout.

One of the outstanding features of the new building is its dye laboratory, built and equipped with $80,000 of a $120,000 gift to the Philadelphia Textile Institute Foundation by the Scholler Foundation, Philadelphia. The gift, one of the largest ever received for textile education, was presented by Dr. Scholler, President of Scholler Brothers, Inc., and a Vice-President of the Philadelphia Textile Institute Foundation. The laboratory of 5,500 square feet will house equipment to be moved from the old building and also much new equipment. The dyeing department of the Institute is one of the oldest of its kind in the country having had its inception in the 1880's. During the first World War the Institute supplied many dyestuff manufacturers with authentic German dye samples.

The Hesslein Library building was built with a $52,000 contribution from the Edgar and Emily Hesslein Fund, Inc., and contains 4,200 square feet of space.

The Philadelphia Textile Institute is the oldest school of its type in this country having been founded in 1884 and is the only privately endowed textile school. There are approximately 4,200 alumni and each year students attend from many foreign countries. The Director of the Institute is Bertrand W. Hayward and the Dean is Richard S. Cox.

The Philadelphia Textile Institute Foundation was formed in 1945 to raise and administer funds for textile education and in particular to increase the facilities of the Institute. Colonel Brown, President of Continental Mills and an alumnus, is President of the Foundation.

The Foundation has raised approximately $1,500,000, almost all of which has been used for the purchase of property, construction of new buildings, and purchase of additional new machinery. It is planned that the Foundation will raise additional funds under its Development Program, which is headed by Charles W. Carvin, President of Charles W. Carvin Company and also an alumnus. Included in the Development Program's building plans is the construction of dormitory facilities and an auditorium-gymnasium. An endowment fund and money will also be provided for increasing faculty salaries. The estimated cost of completing the Development Program is approximately $2,000,000. Excellent support of the Foundatoin's program has been received from more than 2,000 contributors and includes gifts from textile companies all over the country, alumni of the Institute, and civic interests in the Philadelphia area.

• 22nd Chemical Industries Exposition

Grand Central Palace will be the site of the 22nd Exposition of Chemical Industries which opens in New York, N. Y., on November 28 and runs through December 3. The show will commence at 2 p.m. on the former date and will run daily from 11 A.M. to 10 P.M. thereafter except on Wednesday and Saturday when it will close at 6 P.M.

Exhibits reportedly will include a great variety of raw, partially manufactured materials, processing machinery and equipment for all sorts of manufacturing plants. Many displays of apparatus and instruments used in research and in process control will be on hand, according to the International Exposition Company, managers of the exposition.

Of special interest to the textile industries is a two-stage homogenizer designed for the preparation of starch sizings such as are used in the slashing and weaving processes. By converting the starch mixture mechanically by velocity impact and hydraulic shear, instead of by prolonged cooking, it is said that a superior starch can be produced in one-quarter the time normally required. The same method and equipment is reportedly used also in the preparation of fatty emulsions for intravenous feeding, in connection with a newly developed medical technique.

Admission to the exposition is by invitation and registration at the entrance. Further information may be obtained by writing to The International Exposition Company, 480 Lexington Ave., New York 17, N. Y.

• Corn Products Personnel Changes

Carroll R. Keim, who has represented the Chemical Division of the Corn Products Sales Company in the Chicago area for the past two years, will shortly assume new duties as technical representative for the Foreign Department of the Corn Products Refining Company. Mr. Keim's headquarters will be in Europe.

John W. Davey, who represented the Chemical Division in the Pittsburgh area will move to Chicago on November 1st to replace Mr. Keim.

David L. Richardson, Jr., formerly of Mellon Institute, will join the Chemical Division of Corn Products Sales Company and will represent it in the Pittsburgh area starting November 1st.

• Slesinger Appointed Sales Manager

The Dexter Chemical Corporation, 819 Edgewater Rd., New York 59, N. Y., announces the appointment of M. Leonard Slesinger as Southern Sales Manager of their Textile Chemical Division. Mr. Slesinger, who makes his headquarters in Charlotte, has been with the company for the past three years serving as Technical Sales Representative in North and South Carolina.

This is the company's initial step in a program for sales expansion in the Southern areas. Warehouse facilities reportedly have been set-up in key Southern cities. Additional sales personnel has been added to Mr. Slesinger's staff and further additions are contemplated in the very near future.

M. Leonard Slesinger

• Anti-slip Finishing Material

A new anti-slip finishing material (Hartex Fiberlock) in the form of a viscous oil, said to give excellent anti-slip properties and impart a very desirable hand to fabrics, is being marketed by The Hart Products Corp., 1440 Broadway, New York, N. Y. The product is claimed to assure a thick, full-bodied, weighted hand without stiffness or harshness to all types of fabrics. The product is reportedly used to give maximum anti-slip properties to acetate, rayon, nylon, etc. Hartex Fiberlock is said to cause no effect on the light fastness of dyestuffs, no dulling of dyed goods, no rancidity or deterioration on aging, and no discoloration on can drying. The product is claimed readily soluble in cold water and usable with the usual finishing agents such as sulfonated oils, soluble waxes, gums, softening agents, etc.

• Onyx Removal

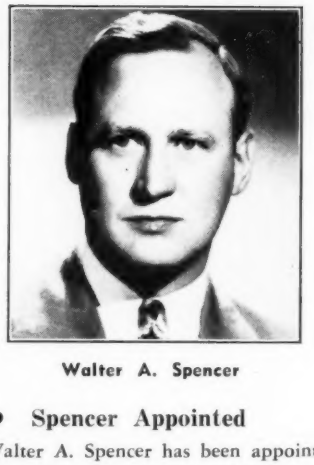
Onyx Oil & Chemical Co., Jersey City, N. J., manufacturers of special chemicals for textile and other industrial plants, announces the removal on October 15 of its New England office from Providence to Boston, where it will be located at 80 Federal Street. This more centralized office location reportedly will improve Onyx service to its customers materially.

Philip E. McLean, New England Sales Manager, will be in charge of the Boston office.

• Pacific Chemical Exposition

The California Section of the American Chemical Society is presenting a program of Pacific Industrial Conferences running concurrently with the Pacific Chemical Exposition. The Exposition, under the management of Marcus W. Hinson will be held November 1-5 at the San Francisco Civic Auditorium.

The Exposition will feature commercial exhibits, industrial movies and special exhibits. Hours will be from 12 noon-10 p.m. Tuesday through Friday and 10 a.m.-6 p.m. Saturday.



Walter A. Spencer

• Spencer Appointed

Walter A. Spencer has been appointed midwestern sales representative for Arnold, Hoffman & Co., Inc., manufacturing chemists of Providence, Rhode Island. A graduate in Chemical Engineering from Iowa State College, Mr. Spencer received a Bachelor of Laws Degree from the University of Wisconsin Law School. He will operate from the Cincinnati sales office, and service the states of Ohio, Michigan, Kentucky, Indiana, and Illinois.

• M.I.T.-L.T.I. Cooperation

Plans for cooperation in the field of textile technology between Massachusetts Institute of Technology and Lowell Textile Institute, assuring increased educational opportunities to students and an interchange of staff members of both institutions, were announced by Dr. James R. Killian, Jr., President of M.I.T. and Kenneth R. Fox, President of L.T.I.

Pioneers and leaders in a technical field so important to New England's historic industry, Massachusetts Institute of Technology and Lowell Textile Institute, beginning this autumn, will pool their facilities for the benefit of graduate and undergraduate students.

This cooperative action covers mutual use of facilities for research and manufacturing at Lowell Textile Institute for M.I.T. graduate student theses, and use of M.I.T. textile division facilities for L.T.I. student theses, particularly at the graduate level; also the use of books, periodicals and theses on textiles and the textile field in both extensive libraries.

By the agreement between M.I.T. and the Lowell Textile Institute, students of the latter may obtain additional work in chemistry, mathematics, business, engineering, and textile technology at M.I.T. Similarly, M.I.T. students will be given the opportunity of working with textile manufacturing and finishing machinery for cotton, wool, and rayon as summer session and other special courses become available at Lowell.

The plans also contemplate the participation of staff members of both institutions in seminars, and for lectures in existing or in new courses.

On the student side, there will be regularly scheduled student trips from M.I.T. to Lowell and vice versa, and there are planned joint meetings and interchange of information between student societies, such as the student chapter of the American Association of Textile Chemists and Colorists and the Engineering Society.

Commenting on the plan, Professor Edward R. Schwarz, in charge of textile technology at M.I.T., said, "The geographical proximity of L.T.I. and M.I.T. and their common interests in textile education make it desirable that closer official cooperation exist between the two groups. For a number of years funds have been available for graduate scholarships at M.I.T. for qualified graduates of L.T.I. through a grant by the Proprietors of the Locks and Canals on the Merrimac River. A number of recipients have completed requirements for the Master of Science degree in Textile Technology, including Mr. Fox, now president of L.T.I. Several faculty members of L.T.I. have from time to time taken special courses at M.I.T. in the field of textile research. Recently the Textron Fellowship for graduate work in textile technology at M.I.T. has been established for the benefit of Textile Institute graduates through the New England Textile Foundation. This year the award went to Phillip A. Gruber from L.T.I.

• 51st Class Enters NBTI

Students from various parts of the world swell the numbers of the Freshman Class which registered on September 12th as the fifty-first entering class of the New Bedford Textile Institute. These Freshman are a part of the group of 285 young men and women who comprise the largest student body ever to attend this institution. It is composed of 236 residents of Massachusetts, 32 citizens of many other states and 17 nationals of such countries as Argentina, Chile, China, Greece, Israel and Pakistan.

In order to maintain the present high standard of instruction at New Bedford Textile Institute, the trustees have elected several new members to the staffs of the various departments. Barron Brainerd of Olney, Illinois, S. B. in Applied Mathematics, Massachusetts Institute of Technology and Howard C. Tinkham of Mattapoisett, Massachusetts, B. S. in Mechanical Engineering, Worcester Polytechnic Institute were added to the Department of Engineering staff. Mr. Brainerd also attended the University of Chicago. Mr. Tinkham holds a Mechanical Course Certificate from the New Bedford Textile Institute. John T. Regan of New Bedford, Massachusetts, A. B., Holy Cross College, and Richard K. Molyneux of Fall River, Massachusetts, an alumnus of New Bedford Textile Institute, have become members of the Department of Textiles staff. Mr. Regan attended the Officers Training School at Harvard University during World War I, has completed several Rhode Island State College extension courses and has held executive positions in several New England Textile establishments. Mr. Molyneux has also served in various executive capacities in textile mills in the same area, having come to New Bedford Textile after thirteen years as superintendent at the Luther Mfg. Co., Fall River.

• New Setting System for Nylon

In designing their new nylon heat setting machine, Van Vlaanderen (Paterson, N. J.) engineers have done much original research and have produced an entirely different heat setting system with definite advantages, according to C. H. Van Vlaanderen, President.

Instead of contact heat applied successively to alternate surfaces of the fabric by a series of heated rolls, Van Vlaanderen reportedly has found that better setting can be accomplished by the use of heated air.

Hot air, thermostatically controlled and directed through the goods almost instantaneously brings every fiber up to the setting temperature as it enters the machine, it is stated. This is said to immediately relieve all strains in the woven nylon and no "frying pan" action results where the material is successively heated on one side and then on the other by hot metal rolls. The machine has only one temperature inside and since no part of the machine or the cloth is ever above the setting temperature of nylon, overheating is impossible, the company states.

The company further states that the initial and operating cost of the new machine will be considerably less than conventional machines.

Tests conducted by Van Vlaanderen have reportedly shown that the desirable qualities imparted to nylon broadgoods (stability against distortion, sag, wrinkling and subsequent shrinkage) by heat setting are successfully accomplished by this new Van Vlaanderen machine at the lowest cost with the highest quality processed goods.

The company has arranged for the trade to see the machine in operation at its plant in Paterson, N. J. and invites visitors to bring a sample of their own nylon broadgoods.

• American Cyanamid Appoints

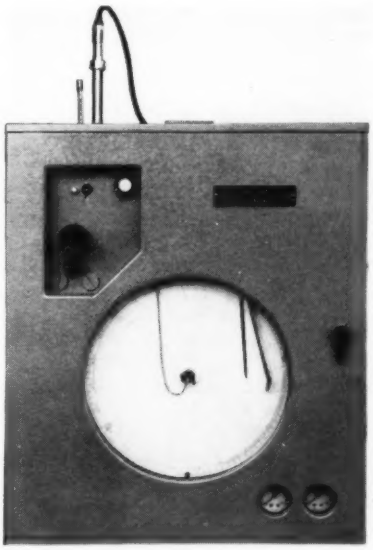
American Cyanamid Company has announced the appointment of Dr. L. P. Moore as Manager of its New Products Development Department. The firm also announced the appointment of Dr. E. W Cook as its European Technical Representative.

Dr. Moore has served as the Company's European Technical Representative since 1946. He has been with the American Cyanamid Company, first in the Stamford Research Laboratories and later in the Company's executive offices in New York for some twelve years. He was also in charge of New Products Development for the Celanese Corporation for two years. His new work will be devoted to the supervision of new products development and market research activities with special emphasis on finding applications for new products coming from the laboratories.

Dr. Cook, who received his degrees from the University of Arkansas and Ohio State University, joined American Cyanamid Company in 1940. He also spent several years in the Stamford Research Laboratories and came to New York in 1946 as Assistant Chemical Director of the Company.

• Robomatic Refractometer

In conjunction with Dow Chemical Company, Precision Scientific Company, 3737 W. Cortland St., Chicago 47, Ill., announces the development of a production control instrument, the Robomatic



Precision-Dow Robomatic Refractometer

Refractometer. It reportedly controls the flow of industrial process streams by refractive index instantaneously, continuously and graphically recording the results 24 hours a day.

The Precision-Dow Ro' omatic Refractometer is said to save operators time by eliminating costly hand sampling. The apparatus operates directly from the stream, and there is an instant response to any product change, the company states. It is also said to provide a continuous and accurate record of the product flowing through the pipe.

The apparatus is claimed to cover the entire range of refractive indices from 1.32539 to 1,54409 controlling over the entire range to within three parts in the fifth decimal place.

In operation, the process liquid is pumped into a constant temperature bath surrounding the refractometer prism. A sodium light behind the bath sends light through the liquid to the eyepiece and also to a photoelectric cell. The response of the photoelectric cell actuates a recording pen. Movements of the pen effect pressure changes in an air controller which in turn operates diaphragm valves in the process pipes.

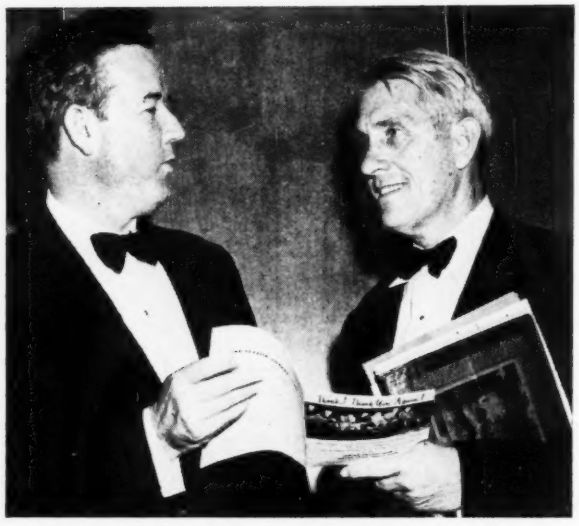
The instrument comprises a dipping refractometer, a constant temperature bath with a range from 35°F. to 150°F., reportedly accurate within 0.02°, a recorder actuated by a photoelectric cell and amplifier, and an air operated controller.

The Robomatic Refractometer is constructed to be flush mounted in an instrument panel and can be installed at any distance from the process pipes, it is stated. A sheet metal housing is finished in Green Hammerloid enamel and is fitted with a locking door having a gastight seal. The instrument is compact—overall dimensions are 19" deep, 34" high, 24" wide.

• Hugh M. Comer Honored

Hugh M. Comer of Birmingham and Sylacauga, Ala., was paid glowing tribute in New York on October 4 by the textile industry in appreciation for the work he has done in its behalf. Mr. Comer, who was guest of honor at the dinner in the Hotel Astor's grand ballroom, was lauded by speakers and applauded by an audience of 600 for his efforts in bringing the story of the textile industry to all sections of the country at trade meetings and industry gatherings.

Mr. Comer, President of Avondale Mills of Alabama, responded to a salute from the Textile Square Club which acclaimed him the industry's "greatest ambassador," with a message in which he emphasized the need "to make important men and important women" as assurance to a better future.



Hon. John J. Sparkman and Hugh M. Comer

Honorable John J. Sparkman, U. S. Senator from Alabama and Maj. Gen. Herman Feldman, Quartermaster General of the Army were the principal guest speakers.

Representatives of various trades from all sections of the country were at the affair, with a large delegation from the Southern Garment Manufacturers Association in attendance. Directors of the Association had scheduled their regular meeting to coincide with the Comer testimonial.

As a momento of the occasion, Mr. Comer was presented with a memory book signed by several hundred leaders in the textile and allied industries. Proceeds from the affair went to support the welfare camp program of the Textile Square Club of New York City, sponsor of the dinner, which was presided over by Harry Riemer, president of the club and editor of the *Daily News Record*.

• Heat Treating Patent Issued

A patent (applied for July 1946) was issued in September 1949 to W. H. Shields, president of the Grand Rapids Textile Machinery Company, Grand Rapids, Mich., covering a method of heat treating Thermo Plastic Fabric.

The patents covers: "The Method of treating Thermo Plastic Fabric which comprises moistening the fabric and winding a length of Thermo Plastic Fabric and a super imposed length of surfacing material onto an electrical conducting core resulting in alternate layers of fabric and surfacing material, surrounding said roll with an electrical conductor, connecting said core and said surrounding conductor in a high frequency electric circuit whereby said high frequency current passes through said roll heating the same, maintaining said current until said roll has become heated to a temperature higher than subsequent processing temperatures required and then disconnecting said current and allowing said roll to cool."

The process reportedly produces highly satisfactory results and is said to be inexpensive to use from the standpoint of cost of operation.

The machines required for presetting Thermo Plastic Fabric by this method are in a Pa-Press unit manufactured by the company for moistening the fabric and rolling it up in paper. The Pa-Press unit also includes a paper reclaiming unit for rerolling the paper after treatment and batching the fabric ready for the scouring and dyeing operation. A Short Wave Induction unit is also required to heat the fabric to the desired temperature. The rolls of fabric are ultimately hung in a rack where a number of rolls can be heated at the same time, it is stated, and the size of the heating unit and rack are determined by the production required.

Grand Rapids (who makes a complete line of processing machinery for Tubular Knit Fabrics) advocates processing Tricot fabric in tubular form by first sewing the two edges together with a two thread overlock seam followed by treating the Tricot fabric like tubular knit goods in the scouring, dyeing and drying operations. This method of processing is recommended because it is said to assure uniform manipulation of the fabric with the minimum of tension, thereby reduc-

ing shrinkage in the finished garments. The company is introducing to the trade at this time two new machines for finishing Tricot ready for the cutting table.

The Slitting and Opening machine is used for cutting the sewed edge off the narrow or 54" Tricot and opening it out to full width whereas the Combination Finisher and Slitter cuts the sewed edge off the wide 108" Tricot and simultaneously slits the opposite edge and forms two single thickness rolls 54" in width.

Grand Rapids reportedly also has ready for the market a new Unit Drier which is small in size but with a large production of 300 to 400 lbs. of cotton goods per hour. The machine will dry rayon, acetate, Nylon or wool and in the case of the latter fabrics turns out even greater poundage, it is stated. This Unit reportedly is now in production; the Standard unit can be seen in operation at the plant in Grand Rapids, Michigan.

• Durion Publications

The Durco high silicon iron lubricated plug valve, now known as Type D, is described in a new bulletin (No. 640) by the Durion Company, Inc., Dayton 1, Ohio.

The valve, produced in its basic design since 1921 reportedly has these changes and improvements: new type lubricator which permits loading with stick or bulk lubricant; composite plug (optional) consisting of Duriron or Durichlor plug and stainless steel shank; Teflon diaphragm at the bottom of the stuffing box which provides an anti-friction corrosion proof seal, and packing glands now made in Durimet 20 (a highly alloyed corrosion resisting stainless steel) as standard. These glands reportedly can be tight and still permit easy timing of the plug.

Another publication, a new free 12 page catalog (General Catalog M), condenses the data published in 54 separate bulletins on corrosive resisting equipment and alloys, for handy and complete reference for the operating, maintenance, consulting, plant, chemical and corrosion engineer. It covers Durco Corrosion Resisting Alloys (Duriron, Durimet 20, Durichlor, D-10, Chlorimet 3 and Chlorimet 2—with composition, physical, mechanical and special characteristics and general corrosion resistance) as well as Durco Corrosion Resisting Equipment (Anodes, Bar, Ejectors, Fans, Heaters, Heat Exchangers, Steam Jets, Pipe and Fittings, Pumps, Kettles, Nozzles, S-bend Condensers, Sinks, Tanks, Tank Outlets, Tower Sections and 16 different types of Valves).

While brief, the data on each item is said to be complete in that features, capacities and sizes and available alloys are given on all of them.

• N. C. State News

The School of Textiles at N. C. State College will have a modern Student-Faculty Service Center sometime after January 1.

Dean Malcolm E. Campbell reported that the center is now being equipped as a result of a $15,000 gift from Stuart W. Cramer, a textile industrialist.

The new center reportedly will include a student lounge with a soda fountain and a snack bar, a lounge for seniors and faculty members, and a terrace with lunch tables and special landscaping. It will be located on the south end of the central wing of the School of Textiles Building and will afford a luncheon place for faculty members and students.

Dean Campbell said the new structure will enable faculty members and students to become better acquainted during the luncheon periods and after classes and will be more convenient as a luncheon center since teachers and students now must walk a considerable distance to eat at the college dining hall.

J. Norman Pease and Company, Inc., is the architect for the center, and T. A. Loving and Company of Goldsboro is the contractor.

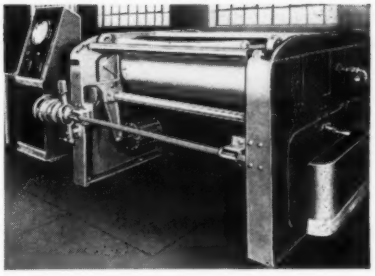
Dean Campbell also announced that William M. Barnhardt of Charlotte, a senior in textile management at N. C. State College, has been chosen as the winner of the $500 Textron Scholarship for the 1949-50 academic year. This scholarship award, which will be presented annually in the future, was established by Textron, Inc., of Lowell, Mass.

• New Butterworth Calender

A horizontal calender that requires no more floor space than vertical calenders is a new development of H. W. Butterworth & Sons Company, Philadelphia.

A unique feature of this new calender is that the balanced pressure design reportedly permits reduction in over-all weight and size. The over-size bases and frames of conventional vertical calenders are not necessary with this new machine, it is stated.

The new Butterworth Horizontal Calender is said to be streamlined, compact and sturdy. In the completely enclosed design of the Butterworth Horizontal Calender, there are four balanced pneumatic air cylinders. Pressures up to 15 tons can be adjusted to each side of the roll to assure even pressures across the face, the company states. It is also stated that rolls are protected against damage by a simple valve mechanism for jumping seams. These rolls are claimed to come apart exactly enough to allow seams to pass and then to be brought together again smoothly and easily.



Butterworth Horizontal Calender

Standard equipment of the new Butterworth Horizontal Calender includes: (1) automatic threading device, (2) ball-bearing friction let-off and disc-winder, (3) pressure recording and drum control speed regulator, and (4) steam heat to center roll. Gas heat arrangement and temperature control equipment are available if desired.

• U.S.C.S. Exam for Technologist

The U. S. Civil Service Commission announces, among other examinations, one for Textile Technologist. Application forms can be obtained from U. S. Civil Service Regional Offices, or where there are not such, from post offices. These must be filed by November 8th.

• Synthetic Fiber Lubricant and Anti-Static

A water solution of Polyethylene Glycol 400 (Mono) Laurate is reportedly an effective lubricant for synthetic fibers which require special lubricants for the thread during sewing operations. It tends to eliminate breakage, according to Glyco Products Co., Inc., Brooklyn, N. Y. Orlon thread is said to be lubricated by passing it over a cellulose sponge saturated with a 1 per cent solution of the product. The sponge is placed between the needle and take-up bar.

Polyethylene Glycol 400 (Mono) Laurate water solutions are said to have good anti-static properties in addition to their lubricating value. Saran and nylon thread ordinarily pick up static electric charges which make them difficult to work with, but such thread passed through a Polyethylene Glycol 400 (Mono) Laurate solution is lubricated and does not pick up a static electric charge, the company states.

No. 777 Chemical Pump

• New Pump Features

A special diaphragm that reportedly stands up unusually well to most fluids is the outstanding feature in the new No. 777 chemical pump now available for shipment from the General Scientific Equipment Co., 2700 W. Huntingdon Street, Philadelphia 32, Pa. It is said to be especially made for lacquer thinner, synthetic thinner, turpentine, acetone, benzene, benzol, perchlorethylene, trichlorethylene, detergent oils, linseed oils, stoddards solvent and many others.

The diaphragm is made of heavy cross weave cord, plastic coated on both sides. Its resistance to chemicals makes this pump ideal for many chemical fluids, the company states.

Plated parts are said to prevent corrosion. The pump is fitted with automatic drain back feature, brass valve seats and bakelite valve disc. It is also reported to be equipped with an adjustable suction pipe, to fit either ¾", 1½" or 2" openings.

Complete information may be obtained from the General Scientific Equipment Co.

• U. S. Rubber Appointment

United States Rubber Company has announced the appointment of Carl M. Patterson as sales representative for its Lastex Yarn and Rubber Thread division in the midwestern market.

Mr. Patterson, whose headquarters will be at 222 West Adams Street, Chicago, reportedly will handle the sale of Lastex and Laton yarns and extruded and cut rubber thread in the midwestern states. His market will include manufacturers of foundation garments, swim suits, hosiery, surgical products, athletic goods and other products using elastic yarn and rubber thread.

Mr. Patterson has been associated with the textile industry for many years as sales agent for cotton, rayon and wool yarns in the midwest territory. He is president of the Chicago Yarn Men's Club.

• Standard Soiled Acetate Fabric Available

The United States Testing Company announces availability of Standard Soiled Acetate fabric. This acetate fabric now supplements the Standard Soiled cotton and wool fabrics introduced several months ago.

The new Standard Soiled Acetate fabric of the company reportedly has the same reflectance as their cotton and wool fabric (i.e., 25% ± 2%). The soil is said to wash out more readily than it does from the cotton and wool because of the smoothness and non-absorbent character of the acetate yarns. In using the acetate, much lower concentrations of detergents should be used, since this is in line with acetate practice, it is stated. All fabrics are about 18 inches wide.

• Hightower Building Dedication

In connection with the 50th anniversary celebration of the A. French Textile School of the Georgia Institute of Technology, the new $1,750,000 Harrison Hightower Textile Engineering Building was dedicated with suitable ceremonies on October 14, 1949.

Sponsoring the event were the Textile Education Foundation, Inc., the Cotton Manufacturers Association of Georgia, the Board of Regents of the University System of Georgia, and the Georgia Institute of Technology. Invitations were sent out to leaders in the textile industry, machinery manufacturers and suppliers throughout the country.

Designed by Bush-Brown, Gailey & Heffernan, Architects, and J. J. Pollard, structural engineer, and constructed by the Ray M. Lee Construction Company, the modern functional building is said to embody the latest type of building materials and to be equipped with up-to-date textile equipment and machinery. The building reportedly cost $1,025,000 and new equipment and machinery about $350,000, which with $375,000 of old equipment brings the value to more than one and three-quarter millions of dollars.

Since the Textile Education Foundation and its founder and first president, the late William Harrison Hightower, were instrumental in securing the necessary funds from the State of Georgia and the Board of Regents for the building and in obtaining more than $350,000 from the textile industry for the new machinery and equipment, the building has been named for Mr. Hightower.

Lawrence Brumby, vice-president and factory manager of Bibb Manufacturing Company, Macon, Ga., was chairman of the Foundation's machinery purchasing committee.

Fred G. LaPiana

• LaPiana New Research Head

Fred G. LaPiana has been appointed Director of Textile Research of Stein, Hall & Co., Inc. He has been a member of the organization since 1925 and during that time has been prominently active in the field of textile research and development. Mr. LaPiana has been serving the textile industry for a number of years as head of the company's Providence, R. I., Textile Laboratory.

• Quebec Section, CATCC Meeting

The first technical meeting for 1949-50 session was held in Salon D of the Mount Royal Hotel, Montreal, on Saturday, October 22nd. This started with a Buffet Dinner at 7:00 p.m. and was followed by the Business Session.

The speaker on this occasion was Bert R. Colentano of the New York Technical Staff of the General Dyestuff Corporation, who discussed "Naphtol Dyeing."

A unique opportunity was afforded all members and friends to hear one of England's outstanding textile chemists in the person of P. Alexander (Ph.D., D.Sc., D.I.C., A.R.E.S., Head of the Research Laboratories, Wolsey Ltd. Leicester England). Dr. Alexander was making a short visit to North America to deliver a paper at the A.A.T.C.C. Annual Meeting in Atlantic City. He has recently completed considerable work on the theory of wool dyeing but is best known for his work in developing Anti-Shrink Treatments (the subject of his address to the A.A.T.C.C.). He holds several patents covering this process. The latest one refers to treating wool in "water with sonic or ultrasonic vibrations of frequency 8-50 kilocycles per sec." and was mentioned in the August, 1949, issue of the *Journal of the Society of Dyers & Colorists.*

• Patents Available for Licensing

January 1, 1944—June 30, 1949

The patents listed below, assigned to the United States Government as represented by the Secretary of Agriculture, are available for licensing on a royalty-free, non-exclusive, revocable, and non-transferable basis.

Further information on any of these patents will be furnished, on request, by the Southern Regional Research Laboratory, 2100 Robert E. Lee Boulevard, New Orleans, Louisiana.

Applications for licensing should be directed to the U. S. Department of Agriculture, Bureau of Agricultural and Industrial Chemistry, Washington 25, D. C.

Copies of the patents can be obtained *only* from the Commissioner of Patents, Washington, D. C., at 25 cents each.

Nat. No. 2,352,707. COTTON YARN FOR WATER-PRESSURE HOSE, Charles F. Goldthwait, patented July 4, 1944. This invention relates to cotton yarn useful in the manufacture of water-resistant fabrics, particularly to the yarn used in making unlined hose for carrying water under pressure. Among its objects is the production of articles with water-holding walls woven from cotton yarn having special swelling properties when wet. In general, the cotton yarn is impregnated with, and has formed on its surface, a cellulosic material which has the capacity of swelling when wet. The preferred method of treating the cotton involves the use of one of the ethers of cellulose, particularly hydroxy ethyl cellulose.

Pat. No. 2,379,574. METHOD OF PRODUCING SURGICAL BANDAGES WITH IMPROVED ELASTIC PROPERTIES.—Charles F. Goldthwait, patented July 3, 1945. A method of improving cotton fabric for use as a surgical bandage by the addition of elasticity is described. Open weave cotton fabric is treated with a solution of sodium hydroxide of about 20 to 25 percent concentration without applying tension, and the resulting shrinkage in all directions imparts to the individual yarns of the fabric many small spring-like crimps. The sodium hydroxide is removed and the fabric is dried while in the non-tensioned state. The elastic properties of this bandage allow much more freedom of movement than usual to bandaged parts of the body without the bandages becoming loose. (See also Pat. No. 2,404,837.)

Pat. No. 2,404,837. METHOD OF MAKING COTTON FABRICS WITH DIFFERENTIAL ELASTIC PROPERTIES, Charles F. Goldthwait, patented July 30, 1946. This invention relates to the production of a cotton fabric which is highly elastic in one direction but relatively inelastic in the other. Such fabrics are prepared by either of two modifications of the general method of causing shrinkage by means of swelling agents: (1) by allowing the shrinkage to take place in only one direction while restraint is exerted to prevent shrinking in the other direction, or (2) by allowing the shrinkage to take place in both directions and then pulling the fabric back by tension in one direction to as nearly as possible its original length or width, depending upon the direction in which the elastic properties are to be developed. In addition to mechanical goods, such as surgical bandages, the improved fabrics have many uses for household and clothing purposes. (See also Pat. No. 2,379,574.)

Pat. No. 2,404,887. STABILIZATION OF NITROCELLULOSE, Richard E. Reeves and Joel E. Giddens, patented July 30, 1946. The use of sulfuric acid in the preparation of nitrocellulose ordinarily necessitates complete removal of the retained sulfate in order to stabilize the product. This is conventionally accomplished by repeated boiling in water and beating treatments, a long and tedious process. It is known that addition of a little ammonia to the boiling water aids in stabilization, but the amount must be controlled very closely because the addition of ammonia beyond slight alkalinity deleteriously affects the nitrocellulose. According to this invention, however, ammonia is used at a lower temperature, preferably room temperature. With this modification of the process, the alkalinity need not be so carefully controlled, and the time of boiling and beating necessary to obtain equivalent stabilization of the nitrocellulose is greatly reduced. (See also Pat. No. 2,471,583.)

Pat. No. 2,405,830. PROCESS OF RECOVERING PEANUT PROTEIN, George W. Irving, Jr., Arthur L. Merrifield, Raymond S. Burnett, and Edwin D. Parker, patented August 13, 1946. Production of different protein fractions from peanut meal can be accomplished by adjusting the pH of an aqueous extract of proteins obtained from substantially oil-free peanut meal to specific values in succession and removing the protein fractions thus precipitated at each pH value. Thus, proteins are obtained which have widely different physical and chemical characteristics and are suitable for a variety of uses such as in the production of adhesives, sizes, paper coatings, cold water paints, films, fibers, and other products. (See also Pat. No. 2,463,740.)

Pat. No. 2,417,869. APPLICATION OF CELLULOSE ETHERS TO TEXTILES, Charles F. Goldthwait, Herbert O. Smith, and Larry B. Barnes, patented March 25, 1947. Cellulose hydroxy ethyl ethers which are soluble in aqueous caustic soda can be brought into a similar thick solution by dissolving them in such aqueous cuprammonium solutions as will dissolve purified cotton or wood pulp. This solution can then be applied by usual methods of padding to yarn or cloth. Drying completes the treatment. Both the cellulose hydroxy ethyl ether and the copper are rendered insoluble and remain in the cotton, which is not damaged. The presence of insoluble copper compounds in goods treated by this method provides resistance to mildew and rotting so that the fabric strength is retained under conditions where ordinary cotton would soon become weakened or destroyed through attack by micro-organisms.

Pat. No. 2,418,224. CELLULOSE ACETATE PLASTICIZED WITH AN ARYL MORPHOLIDOPHOSPHATE, Louis W. Georges, patented April 1, 1947. This invention relates to plasticizers which are solvents for cellulose acetate and which retard the burning rate of cellulose acetate compositions. Compounds of the class known as aryl morpholidophosphates were found to be suitable for this purpose. Film-forming compositions of cellulose acetate employing either di-phenyl morpholidophosphate or di-cresyl morpholidophosphate as a plasticizer are described. (See also Pat. No. 2,429,679.)

Pat. No. 2,421,113. VEGETABLE PROTEIN HYDRATES, Raymond S. Burnett and Earl J. Roberts, patented May 27, 1947. Relates to a process for preparing fluid, comparatively stable and relatively clear vegetable protein hydrates. The term "hydrate" is used rather than the term "dispersion" because the compositions appear as homogeneous (one-phase) solutions of water in protein while dispersions are considered to be heterogeneous (two-phase) mixtures of protein in water. The process consists of forming a mixture of water and protein, the quantity of water being about 50 percent of the hydrate (enough to completely hydrate the protein but not more than the amount which the protein molecules will bind), and the hydrate having a pH of about 7.0.

Pat. No. 2,428,843. FLAME-RESISTANT CELLULOSIC MATERIAL AND PROCESS FOR PRODUCING SAME, Louis W. Georges and Carl Hamalainen, patented October 14, 1947. A process for preparing a flame-resistant fibrous cellulosic material by reacting a material, such as cotton in the dry state, with a hot solu-

tion of 2,4,6-trichlorophenyl isocyanate in pyridine is described. One object of this process is to prepare cellulosic fibrous materials with a fire retardant which is an integral part of the cellulose, being chemically combined with the cellulose molecule, and in which the fire-proofing effect will be retained permanently irrespective of washing. Another object is to prepare a fire-resistant derivative of the cellulose in the textile in which there is substantially no impairment of the fiber structure and loss in tensile strength.

Pat. No. 2,429,679. COMPOSITION CONTAINING A CELLULOSE COMPOUND AND A MORPHOLIDE, Louis W. Georges, patented October 28, 1947. Morpholides obtained by reacting morpholine (tetrahydro-p-oxazine) with acylating agents of certain organic acids, such as caprylic, capric, lauric, myristic, palmitic, benzoic, abietic, and adipic acids, were found to be excellent plasticizers for cellulose acetate and other cellulose derivatives. Film-forming compositions employing such plasticizers are described. (See also Pat. No. 2,418,224.)

Pat. No. 2,443,897. PROCESS FOR THE PRODUCTION OF SWEETPOTATO STARCH, Gregory M. Dexter and Francis H. Thurber, patented June 22, 1948. Patent relates specifically to a rapid, efficient, and continuous method for extracting starch from sweetpotatoes. Pectins and similar substances, solidified with lime water, remain in the pulp; solubles are removed in a continuous centrifuge; and starch is separated by means of a countercurrent screening system. The pulp is pressed and dried; and the starch is purified in a series of three continuous centrifugals. Colored compounds then are destroyed with sodium hypochlorite, the salts formed in this stage being eliminated by washing on a continuous filter. Finally, the starch is dewatered by means of a perforated basket centrifugal and dried with a suitable rotary drier. Process may be applicable to the production of other root starches.

Pat. No. 2,448,153. PROCESS OF MAKING COTTON TEXTILES WATER-ABSORBENT AND ROT-RESISTANT, John David Reid and George C. Daul, patented August 31, 1948. Describes a method of partially carboxymethylating cotton cloth to give a material which should be useful in producing articles which need to be highly absorbent, or which require rot-proofing. The textile product is impregnated with chloroacetic acid, then treated with an alkali metal hydroxide such as sodium hydroxide of concentration between 20 and 50 per cent. This gives a swellable, water-absorbent fabric having approximately one carboxymethyl group per 40 to 5 glucose units. Subsequently, the cloth may be treated with a solution of a salt of a metal, such as copper or mercury, which produces a non-soluble metal salt of the carboxymethyl groups on the textile. This latter treatment renders the fabric rot-resistant. Further modifications of partially carboxymethylated products also are possible.

Pat. No. 2,459,222. INTRODUCTION OF AMINO GROUPS INTO CELLULOSE, John D. Guthrie, patented January 18, 1949. This invention is a practical process for the introduction of amino groups into cellulose textiles. The cellulose is wet with an aqueous solution of sodium hydroxide (mercerization strength of about 25 per cent preferred), containing also 2-aminoethylsulfuric acid (preferably about 10 per cent), then is heated at a temperature from 70 to 110 degrees C. for a minimum period from 40 minutes to 9 hours. The preferred temperature and time of heating are about 100 degrees C. and about 40 minutes, respectively. After the heating, the cellulose is washed to remove the sodium hydroxide. Nitrogen up to about 0.60 per cent is readily introduced by this procedure, and the treated fabric dyes darkly and fast with acid wool dyes. It also lends itself to rot-proofing treatments and is slightly water-repellent. The 2-aminoethylsulfuric acid may be readily produced by reacting the relatively cheap products, fuming sulfuric acid and ethanol amine.

Pat. No. 2,462,803. FIREPROOFING COMPOSITIONS, Kenneth S. Campbell and Jack E. Sands, patented February 22, 1949. A flameproofing composition (consisting of chlorinated paraffin wax, a water-soluble urea-formaldehyde condensation product, and antimony oxide emulsified in water with an emulsifying agent) is described together with a process for applying it to organic combustible materials. The application includes impregnation of the material in such a manner as to control its increase in weight, then drying and heating to polymerize the urea-formaldehyde condensation product. The fire-retarding action thus obtained remains substantially undiminished after numerous launderings; and the treated material, if used for clothing, is practically as comfortable to the wearer as the original untreated cloth. No more than about a 25 per cent increase in weight and a moderate decrease in air permeability occur, whereas by other methods as much as an 80 per cent increase in weight takes place and almost all air permeability is lost.

Pat. No. 2,462,933. PROCESS FOR MANUFACTURING ARTIFICIAL FIBER FROM PROTEINS CONTAINED IN COTTON SEED, Jett C. Arthur, Jr., Melvin L. Karon, Adrian F. Pomes, and Aaron M. Altschul, patented March 1, 1949. Cottonseed protein, as it is normally prepared from cottonseed meal, is obtained in such a form and contains such cross-linkages that preparation from it of dispersions suitable for spinning into fibers is impossible. This patent, however, describes a process by which the cottonseed protein is first treated with acids in such a manner as partially to denature it, to break the cross-linkages which interfere with the dispersion. and to transform the protein into a form from which dispersions can be made. Another result of this treatment is to change the structure of the protein into a more linear form so that its dispersions become tacky and stringy and generally more suitable for fiber production. Such dispersions were successfully spun, stretched, and hardened to produce fiber suitable for textiles and other purposes.

Pat. No. 2,463,740. PREPARATION OF PEANUT PROTEIN FREE FROM PEANUT SKIN PIGMENT, Raymond S. Burnett, patented March 8, 1949. Describes a process by which shelled, unskinned peanuts in the form of kernels are exposed for a few seconds to a dilute aqueous alkaline solution to remove pigment from the skins, then are washed, partially dried, and separated into oil and light-colored meal, from which latter a high quality protein suitable for many industrial uses may be obtained. The patent also describes similar removal of soluble pigments in peanut kernels by a few seconds' exposure to dilute acid, which might be desirable if the protein is to be extracted by acid solutions. However, treatment with alkali was found to remove most of the acid soluble pigment, or color bodies, from the peanut skins. (See also Pat. No. 2,405,830.)

Pat. No. 2,471,583. STABILIZATION OF NITROCELLULOSE, Richard E. Reeves and Joel E. Giddens, patented May 31, 1949. Describes a process for the stabilization of nitrocellulose using ammonium salts instead of hydroxide as covered by Pat. No. 2,404,887. If the treating solution is buffered to remain slightly acidic, excess salt can be used with a hot solution with no harmful effect on the nitrocellulose, and thus can be introduced in connection with a boiling treatment. Ammonium salts which yield ammonium ions in the aqueous solution may be used. Ammonium sulfate is preferred although such salts as ammonium chloride and ammonium carbonate appear to be equally effective. (See also Pat. No. 2,404,887.)

• General Dyestuff Releases

General Dyestuff Corporation, 435 Hudson St., New York 14, N. Y., announces release of circulars describing the following products:

*Rapidogen Yellow 14GA**—an azoic compound soluble in caustic soda which, after printing and acid aging, develops in the form of an insoluble dyestuff which possesses very good fastness properties. The dye, when printed in the usual manner for Rapidogens on cotton and rayon, reportedly produces bright greenish-yellow shades of excellent fastness to light and good to very good fastness to chlorine and washing. The excellent light fastness of the product should be of particular interest as it is said to be fast enough for drapery prints. The dye also is claimed to have excellent solubility when dissolved with the requisite amount of alkali, producing print pastes of very good stability. When printed in the conventional manner alongside other Rapidogen or Algosol brands it develops easily in acid fumes, it is stated. Rapidogen Yellow 14GA produces fast to light Kelly Green shades in combination with Algosol Green IBW, when printed according to the customary neutral chromate formula. When dissolved with the company's Developer Base RPN in place of caustic soda, developing may be carried out in neutral aging. The product, it is said, can be overprinted with caustic soda without being materially affected in shade.—*Circular G-605.*

Indanthrene Red Brown 5RF Paste CF†—a homogeneous anthraquinone vat dyestuff of a pronounced reddish brown shade with excellent all-round fastness properties. For this reason it should be of interest for use on materials such as towels, shirtings and awnings requiring outstanding fastness to light, chlorine, washing and weather exposure. This dye reportedly has very level dyeing properties and may be used for application by the pigment or reduced methods on cotton piece goods, raw stock or yarns. It dyes rayon and cotton, rayon and wool in tone and is recommended by the company for mixed fiber work of these types. The product is claimed suitable for package machine dyeing and may be applied by the vat acid method. It is also said to be suitable for high temperature reduction as utilized in recent continuous methods. The dye is not standardized for printing.—*Circular G-606.*

Indanthrene Red RK Double Paste—a homogeneous anthraquinone vat dyestuff of good fastness to light, washing and chlorine. It should be of partciular interest for use on materials such as towels, shirtings and awnings requiring maximum fastness to laundering and weather exposure. The paste is said to have very level dyeing properties and is suitable for application by the pigment pad or reduced methods on cotton piece goods, raw stock or yarns. It reportedly dyes rayon and cotton, rayon and wool in tone and is recommended for mixed fiber work of these types. It is suitable for package machine work, it is said, and for reduction at the higher temperatures utilized in the new continuous methods.—*Circular G-608.*

Indanthrene Scarlet 3GA Extra Paste Fine—a new straight vat dyestuff which is a valuable addition to the company's range of Indanthrene dyestuffs. It is standardized in a form suitable for dyeing and printing. The dyeings are said to yield a brilliant shade of scarlet which cannot be duplicated with any mixture of available vat dyes with equally excellent fastness to light, particularly in pale shades. The new product has excellent fastness to light, washing and chlorine, the company states. It is recommended by the company for application according to the reduced and the pigment method for the dyeing of cotton piece goods, rayon piece goods and blends of these two fibers. It is also said to be satisfactory for dyeing spun rayon-wool fabrics. For the dyeing of cotton yarn, it is recommended by General Dyestuff for use in all types of apparatus including package dyeing machines. It is claimed unaffected by the high reduction temperatures used in the Williams machine method of application. Reportedly a non-drying, speck-free, smooth paste, the product is in the proper physical condition for printing on cotton and rayon fabrics according to the conventional manner for vat colors. Interest is anticipated in the product for producing full scarlet shades in application and discharge printing of dress goods fabrics. In light shades it is stated that it should serve as a valuable base component for producing tea rose, salmon and other light shades with excellent fastness to light, thus making it particularly satisfactory for beach wear, draperies, etc.—*Circular G-612.*

Indanthrene Brilliant Yellow 3G Paste—a new, homogeneous, anthraquinone vat dyestuff for dyeing cotton, rayon and mixtures containing cotton or rayon and wool. This dyestuff reportedly produces bright greenish yellows which meet the pressing demands of the trade for improved fastness properties of such shades. The reported outstanding fastness to light, laundering and weathering of this dye should be of interest to the dyer of yarn or piece goods for toweling, sports wear, sheetings and draperies. The paste dyes cotton and rayon, rayon and wool in tone and is recommended by the company for such work. The appearance of such fabrics as tackle twill and spun rayon and nylon blends is said to be excellent. Since this dye retains its excellent fastness in combinations and possesses relatively high tinctorial value it is useful for combination shades where fastness and economy are important, it is stated. It is further stated that the quality of the dispersion and the level-dyeing properties of this vat paste make it suitable for use in circulating machines and for the dyeing of cotton or rayon piece goods by either pigment or reduced methods. It is likewise claimed suitable for application at the higher temperatures of reduction employed in the new-type continuous range. —*Circular G-619.*

*Eulan NK***—an efficient mothproofing compound which reportedly has strong affinity from a neutral bath for wool and other animal fibers. Due to this affinity, the product is claimed very fast to water in contradistinction to the silicofluorides frequently used for mothproofing. The latter are said to readily leach out when the fabric comes in contact with water. Eulan NK is also said to be fast to repeated dry cleaning.—*Circular G-618.*

* U. S. Pat. No. 1,882,561.
† U. S. Pat. No. 1,885,172.
** U. S. Pat. No. 1,921,364.

• QM Textile Specification Requirements

A new Textile Series report, designed to assist the industry in meeting increased requirements for Army and Air Force textiles, has been announced by the Quartermaster Corps Research and Development Branch. The report, No. 56 "Summary of Specification Requirements for Quartermaster Textiles" is basically a guide for government procurement which is said to give an analysis of all phases of fabric construction. Tables included were prepared by the Textile Materials Engineering Laboratory, Philadelphia QM Depot and reportedly include all physical and general requirements as to finish for each fabric construction.

Dr. S. J. Kennedy, Research Director for Textiles, Clothing and Footwear of the Research and Development Branch, Military Planning Division, Office of the Quartermaster General, Washington, D. C., urges the checking of the data of specifications listed against actual requirements called for in invitations to bid since requirements stated at the time of actual procurement will supersede any specification requirements stated in the report.

Copies of the publication are available for distribution. Requests should be addressed to the Office of Technical Services, United States Department of Commerce, Washington, D. C.

• PATENT DIGEST •

PAUL WENGRAF

Cellulose and Starch Solutions—Treatment with Nitrogen-oxides A, 4, 0X1

U. S. Pat. 2,472,590
(Eastman Kodak Co., Kenyon and Unrush, June 7, 1949)
U. S. Pat. 2,473,473
(Eastman Kodak Co., Hiatt and Crane, June 14, 1949)

These two patents might be consideerd as connected due to the fact that starch and cellulose in many cases undergo analogous reactions with the same chemical. In the Kenyon-Unruh patent evidence is offered that starch of various types, subjected to the action of NO_2, can be transformed into a new product having a substantial carboxyl-content and a low content of nitrogen. It can be concluded that part of the aldehyde groups contained in the starch molecule are oxidized to COOH groups whereby the solubility in dilute alkalis is considerably increased. It is remarkable that this oxidizing process is not identical with standard oxidizing methods used for producing dextrine or sugar (which is a true degradation). In this reaction the constitution of the starch molecule is not substantially changed. The new starch compounds can be applied as sizing agents and used for numerous other purposes (in the manufacture of surgical gauzes, as easily dispersible materials for foodstuffs, and so on). In carrying out this oxidation method it is necessary to reduce the amount of moisture in the reaction chamber to a minimum. NO_2 or its dimer, N_2O_4, can be applied either in liquid state or in the form of an organic solvent solution such as carbon tetrachloride, benzene or the like. The basic idea of this invention can be seen in U. S. Pat. 2,232,990, 1941, assigned to the same company by Yackel and Kenyon, describing a treatment of cellulose with nitrogen dioxide for the purpose of preparing an oxidized cellulose derivative, likewise soluble in dilute alkalis and different from oxycelluloses known heretofore.

U. S. Pat. 2,473,473 belongs to the same group of patents, consisting of NO_2 or N_2O_4 compounds of the carbohydrate class. In the present patent "low viscosity cellulose" (i.e., a product obtained by degrading cellulose to some extent with a mixture of acetic and sulfuric acids at 100°F.) has to be applied. Thereupon the acid has to be neutralized by a treatment with Ca- or Mg-salts and this product is dissolved at low temperatures (26-28°F.) with a mixture of N_2O_4 and N_2O_3. The mixture of nitrogenoxides can easily be prepared by adding small amounts of water (for instance, 0.5%) to liquid nitrogen tetroxide. Practically, the cellulosic material is introduced into liquid N_2O_4 and the water is cautiously added to keep the temperature down. The final product has a relatively high content on carboxyl-groups and a very small amount of nitrogen, thus the substance is analogous in this respect to the modified starch described above in U. S. Pat. 2,472,590. It can be dissolved in dilute alkalis for sizing and film forming purposes and also for fiber manufacture.

Reference is made to the digest of U. S. Pat. 2,423,707 (REPORTER 1947, 666) and U. S. Pat. 2,448,892 (REPORTER 1949, 205).

Dyeing Cellulose Acetate—with Leuco Vat Dyes C, 4, 02

U. S. Pat. 2,476,287
(Celanese, Croft and Hindle, July 19, 1949)

The strongly alkaline nature of the normal vat dyestuff solutions excludes the general use of this dyestuff class in printing or dyeing acetate of cellulose. It has been discovered that vat dyestuffs may be applied in reduced (leuco-) form without adding alkalis which saponify the fiber and impair the breaking strength, appearance and dyeing properties of these filaments. The method protected by the present patent consists of reducing the vat dyestuff in alkaline solutions as usual and precipitating the formed leucovat dyes by adding a lower alcohol, preferably ethanol. The precipitate is dissolved thereupon in water and the leucovat is applied to the fiber and re-oxidized with perborate, peroxide, etc. An example calls for dissolving 500 p. Calcosol Red BN double paste with 250 p. b. w. sodium hydroxide and 350 p. b. w. hydrosulfite in 5000 p. water and precipitating this solution with 8000 p. b. w. ethylalcohol. The precipitate which settles out after some time is filtered, dissolved in water and used for dyeing at 120°F. The dyeings obtained by this method (and another example which gives a formula for dyeing with Indanthrene Brilliant Green B paste) are conspicuous by their fastness to washing, light and acid fading.

References cited by the Patent Office among others:

U. S. Pat. 2,182,963 (Celanese) suggests dissolving a vat dye in an organic solvent, to reduce the dye in the same solution with zinc formaldehyde sulfoxylate and to dye with this liquid in the absence of water.

U. S. Pat. 2,174,372 (Carps Garenfabrieken) consists of dyeing with vat dyes, reduced in dilute alcohol, acetone or pyridine solution. The material is immersed in a comparatively concentrated vat and dyeing is continued after further dilution with water. This process is not adapted for acetate of cellulose because of the presence of excess alkalis.

U. S. Pat. 2,136,428 (Du Pont) in which indigoid dyes, especially indolindigoid dyes, are transformed into stable leuco compounds by reacting them with alkali-hydrosulfite in absence of alkalis. The leuco product precipitates in this process.

U. S. Pat. 2,107,526 (H. Dreyfus)—also Brit. P. 444,593—states that the free leuco compounds have considerable affinity for cellulose esters. They are applied in the free form. The fabrics are heated in an oxygen-free atmosphere (carbon dioxide) to 75°C., dried and oxidized

In U. S. Pat. 1,803,219, 1931 (Tagliani) the rapidly decomposing vats of Indanthrene Blue RS, used for dyeing resist printed fabrics, are stabilized by adding small amounts of mixtures of cresols and methyl cyclohexanol (thus, "Mercerol").

Other reference: this present process describes a new way for applying precipitated and stabilized leucovat compositions. Former methods suggested the use of protective colloids for this purpose (see Brit. P. 440,983 of Imperial Chemical Industries.)

Dyeing Nylon and Insoluble Acetate Dyes, Mono- and Multifilaments Combined C, 4, 07

U. S. Pat. 2,480,755
(Du Pont, Ryan, August 30, 1949)

Dyeing Nylon fibers with various dyestuff groups has been discussed (as

quoted in this specification) by P. H. Stott in REPORTER of October 2, 1939. Several patents have been granted in the meantime, consisting of the dyeing of this fiber with direct dyes (REPORTER 1949, 363, U. S. Pat. 2,458,379), with acid chrome colors (REPORTER 1947, 579. U. S. Pat. 2,421,131) or with vat dyes or indigosols (REPORTER 1949, 564. Brit. P. 603,154). However, the inventor states that up to the present time the water involuble acetate dyes have given the best results in dyeing polyamide filaments, particularly in hosiery dyeing. Recently there have been introduced in the trade new types of sheer nylon hosiery, consisting of 10-20 den. monofilaments in the leg part and of 30-60 den. multifilaments in the welt. These types of fabrics were found to give insufficient levelness in dyeing with acetate dyes. The leg part appeared darker than the welt. The object of this invention is to improve the uniformity of dyed hosiery composed as mentioned above of mono- and multifilaments. The problem can be solved by carrying out the dyeing operation in the presence of 2-10% tannic acid based on the fabrics weight, adding preferably a lower organic acid such as acetic or formic acids and a higher fatty alcohol sulfate (Duponol). The scoured goods can also be pretreated at 110-130°F. with a mixture of tannic and acetic acids. In an example, 4 lbs. of the hosiery of the type described above are scoured, rinsed and treated for 15 minutes with an aqueous solution of 0.193 lb. tannic acid and 0.11 lb. acetic acid (first at 90°F., thereafter at 125-130°F. while continuously agitating). Following that a mixture of acetate dyes (yellow azo dyestuffs, Acetamine Scarlet B and Celanthrene Brilliant Blue FFS) dispersed with Duponol was added and dyeing was effected at 160°F. for 2 hours. A Bronze-skin shade, showing an excellent balance between the leg and the welt part resulted.

Reference cited by the Patent Office:
The Patent Office refers to a publication in REPORTER of May 3, 1948, 299-300 (Clapham) disclosing a process for dyeing hosiery, composed from mono- and multifilaments. A pre-treatment with tannic acetic acids is suggested.

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Abstracts—

(*Continued from Page 780*)

Roller Printing Troubles

"Technicus", British Rayon and Silk Journal, page 64, Vol. XXVI, No. 302, July, 1949.

This article discusses some of the ways in which cloth can be damaged when printing with engraved copper rollers and indicates how these troubles may be avoided. Among the items covered are "snibs" or "snappers" which are generally small horizontal marks or bars occurring in regular intervals, seam trouble caused by short pieces of sewing threads, scums which consist of a light roughening of the unengraved surface of the copper rollers, bad ends of pieces, crookedly sewn ends, and soiling.

Crease-Resistant Finishes with Urea-Formaldehyde Resins

Leonard Shapiro, Rayon and Synthetic Textiles, page 39, Vol. XXX, No. 8, August, 1949.

The effect of fiber, yarn and fabric structure on crease-resistance is discussed as well as the effect of type and quantity of resin. The conventional methods of desizing, scouring, dyeing and washing are generally adequate for the preparation of the goods. Instructions are given for the preparation of the impregnating bath. The concentration of resin required depends upon the type of fabric, the finish desired, and the pick-up obtained on the padder. Impregnation of the fabric with the resin solution is generally done on a 2- or 3-roll padder. The padder and tenter are generally arranged for continuous operation. It is preferred to place a J-box between padder and tenter to minimize tension. Polymerization of the resin on the fiber is accomplished by curing or baking at elevated temperature. Overcuring must be avoided. Curing time must be determined empirically for each curing setup and for each new fabric construction. After curing, the goods are washed in a soda ash and synthetic detergent bath to remove incompletely polymerized resin and to neutralize the acidity developed during curing. The goods are then washed in hot water and dried. Softeners or finishing agents are preferably applied after the goods are cured and washed and before the final drying. The shade of many dyes is altered by resin treatment and dyestuff manufacturers can advise what to expect in this regard.

Application of Vat Dyes by Pad and Continuous Unit Methods

Frederick A. Alter, Textile Age, page 42, Vol. 13, No. 8, August, 1949.

The type of padder best suited for faster production is the three-bowl padder with a double dip and double nip. A second unit may be set next in line which is equipped as a washer unit having one or two compartments, each with a pair of squeeze rolls of good quality rubber. This should be followed by a similar unit of one or two compartments similarly equipped with squeeze rolls. The first compartment is used for the oxidizing bath and the second for a warm water wash.

The equipment for the continuous dye range consists of a three-bowl padder, a two-compartment section with squeeze rolls at each compartment, two compartments of the same type with good squeeze rolls for the oxidation baths, two more compartments for a further wash in hot water, followed by two more compartments for two hot soapings, and two final compartments, one for hot washing and one for cold washing. Instrumentation is recommended to maintain uniformity of temperature for the duration of any run. Instructions for making up color solutions and operation of the range are given.

The Autoxidation of Alkali Cellulose
I—An Experimental Study of the Kinetics of the Reaction

D. Entwistle, E. H. Cole and N. S. Wooding, Textile Research Journal, page 527, Vol. XIX, No. 9, September, 1949.

The authors' abstract follows:
The kinetics of the uncatalyzed oxidation of alkali cellulose by molecular oxygen (autoxidation) have been studied. It is shown that a linear relationship exists between the copper number of cellulose regenerated from a freshly prepared alkali cellulose and the initial rate of autoxidation of the alkali cellulose. As reaction proceeds, however, the fate approaches a constant value which, under given conditions, is independent of the initial copper number. Peroxides are formed during the reaction, to an extent which is dependent upon trace concentrations of various heavy metals. The effects of temperature, oxygen pressure, and alkali cellulose composition on reaction rate are discussed. The results are consistent with the present picture of autoxidation processes being free-radical propagated chain reactions.

The Formation of Polymers in Wool

M. Lipson and J. B. Speakman, Journal of the Society of Dyers and Colourists, page 390, Vol. 65, No. 8, August, 1949.

The authors' abstract follows:
When wool fibers are impregnated with a dilute solution of ferrous ammonium sulfate, dried, and then treated with a solution of methacrylic acid containing a trace of hydrogen peroxide, preferential internal polymerization is brought about by the hydroxyl radicals formed inside the fibers when the hydrogen peroxide encounters the ferrous ions. The reaction proceeds best at low pH values in absence

of oxygen. Preferential internal polymerization of water-insoluble monomers can also be brought about if they are emulsified with Lissolamine V, and no difficulty has been encountered in forming copolymers of methacrylic acid and methyl methacrylate, for example, within the fibers.

Such internal deposits of polymer can be used to modify the properties of wool in a number of ways. When the polymer is acid, two-tone effects can be obtained by dyeing treated and untreated wool in the same dyebath, (the treated wool taking a lighter shade). Conversely, when the polymer is basic, the treated wool takes a darker shade. In addition, internal deposits of polymer are capable of increasing the wear resistance and reducing the milling shrinkage of wool fabrics. Finally, if the monomer carries reactive side-chains, (e.g., methacrylamide) internal polymerization followed by cross-linking with formaldehyde causes a striking increase in the resistance of wool fibers to extension in water. It is not yet known whether cross-linkages are formed between the polymer and the wool, but reactions of this type should be useful in strengthening intact fibers and repairing damaged fibers.

The Dyeing of Leather

D. H. Tuck, Journal of the Society of Dyers and Colourists, page 386, Vol. 65, No. 8, August, 1949.

Hides and skins are one of the most nonuniform raw materials. This nonuniformity is further increased by ante and post mortem defects in the skin. There are four types of tanning: vegetable, mineral, (employing basic chromium sulfate or alum and salt, etc.), formaldehyde, and oil, all of which have different dyeing properties.

Natural dyestuffs are used mainly for alum leathers but Hematine is commonly used for the production of black on all types of leather. Basic dyes are employed mainly for dyeing vegetable-tanned leather, all the loose tannin being first fixed with tartar emetic, potassium titanium oxalate, etc., and also for dyeing mordanted chrome leather. They are generally used only when their use cannot be avoided such as for producing rich surface dyeings. Acid dyes are applicable to all types of leather. Direct dyes are used for dyeing chrome and semichrome leathers, in which case surface dyeings are mainly obtained. Premetallized dyes are used for dyeing chrome, alum, oil, and aldehyde leather. Their high cost limits their use to special purposes. Chrome mordant dyes are considerably used by glove leather tanners. Sulfur dyes are used for dyeing oil-tanned leathers.

The type of apparatus for dyeing depends on the tensile strength of the leather. Paddles and drums are used. Skins required to have an undyed flesh are either brush dyed or fixed together in pairs and dyed by dipping. The temperature is governed by the stability of the tannage and the pH by the tannage and type of dyeing required. A number of specific examples of dyeing are given.

Pore-Size Distribution in Textiles

Edward G. Burleigh, Jr., Helmut Wakeham, Edith Honold and Evald L. Skau, Textile Research Journal, page 547, Vol. XIX, No. 9, September, 1949.

This article is summarized as follows:

The mercury-intrusion method for the study of pore-size distribution, developed in the field of petroleum technology, was modified to extend the pressure to a lower range and applied to the study of textile fabrics. The pore-size distribution curves obtained for 10 selected fabrics indicate that the method can be used to show significant differences in fabric porosity in the range from about 0.2 micron to 20 microns. The peaks of these curves for all the fabrics studied fall between 2 and 4.5 microns. Analysis of the results shows that these peaks are due predominantly to the interfiber pore-size distribution and that their positions are dependent upon such features as "fineness" or maturity of fiber, and yarn compression.

A comparison of the peaks of the pore distributions with air-permeability data indicates a correlation between the interfiber pore spaces and the air permeability. However, the interyarn porosity may sometimes be a significant factor.

The high-pressure curves for cotton fibers indicate a collapsing of the lumen. This conclusion is supported by the fact that cotton fibers show a volume change three times that of rayon filaments when each material is pressured to 10,000 p.s.i.a. Accordingly, pore-radius distribution curves derived from the pressuring curves obtained at such high pressures on a nonrigid pore system such as that found in cotton fiber are considered unreliable.

Urea as a Solvent Aid for Cellulose Textile Sizes

Clinton W. Tasker, Textile Research Journal, page 563, Vol. XIX, No. 9, September, 1949.

The author's abstract follows:

Urea was evaluated as a solvent aid for alkali-soluble ethylene oxide ethers of cellulose which are suitable as textile sizes. It was not found to be an economical aid for this purpose, although it apparently reduced solution viscosity. The ratios of caustic to water and cellulose ether to water were shown to be the main factors controlling solution viscosity. Based upon the fact that urea has a very high partial and apparent molal volume in aqueous solutions, it is suggested that urea acts as an inert diluent when incorporated into alkaline solutions of the ethylene oxide ethers. Further, it was shown that urea could bring about either increases or decreases in the viscosity of these ether solutions, depending upon whether urea is added to or replaces water in any given system.

Factors Affecting pH Control

Canadian Textile Journal, page 45, Vol. LXVI, No. 18, September 2, 1949.

There are many factors, besides the addition of acid and alkali, which can influence pH. The factors discussed in this article are: type of acid (alkalies) in reaction (strong and weak), concentration of solution, components already present in solution (buffer), temperature, absorption by inert materials present (i.e. cloth), the atmosphere, the instruments and indicators.

—◆ ◆—

• Mutual Positions Plan

Chemists and chemical engineers make up approximately 10% of the membership of one of the nation's most unusual non-profit organizations, it was revealed by C. Dean Brossman, Vice President of the Mutual Positions Plan Association.

This recently formed association is described as a cooperative group that applies modern research, sales and marketing techniques to the problem of helping its white collar members to prepare themselves to land the job they want and are best fitted for. Scientific job counselling is said to be but one phase of the association's activities.

Located at 55 William Street, New York, the association already has 140 members and will soon function nationally, according to Mr. Brossman, who points out that present members range from $70 a week draftsmen to $25,000 a year executives.

Already included among its members are a research specialist in the field of natural and synthetic rubber and a chemist with considerable experience in atomic energy research. The association is also assisting several foundry, metallurgical and textile chemists.

Mr. Brossman explains that membership is limited to executive, professional, administrative and technical white collar personnel who pay moderate annual dues. Funds are retained in the organization reportedly to provide its members with special services which already include a comprehensive self-improvement library stocked with technical works related to their specific fields.

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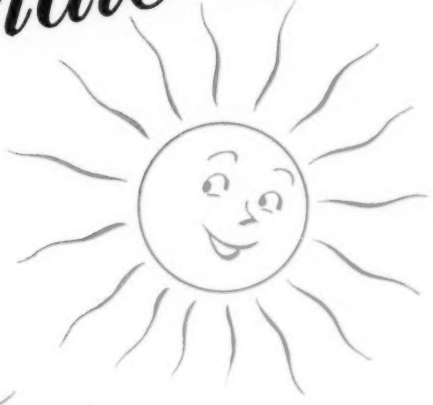

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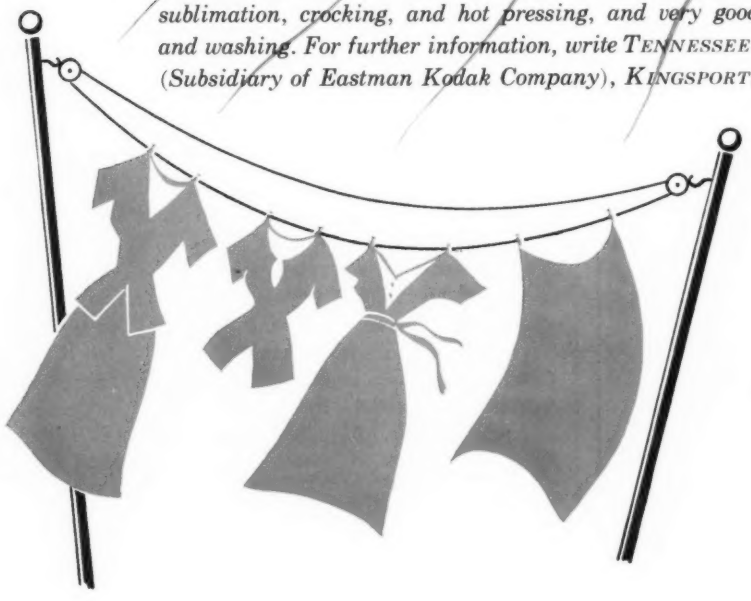

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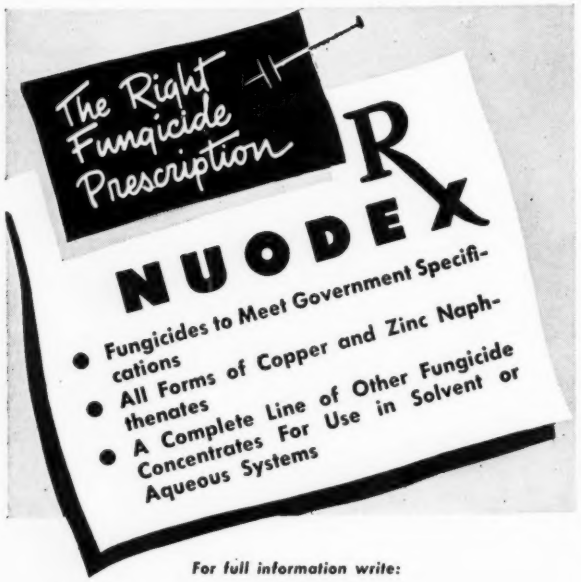
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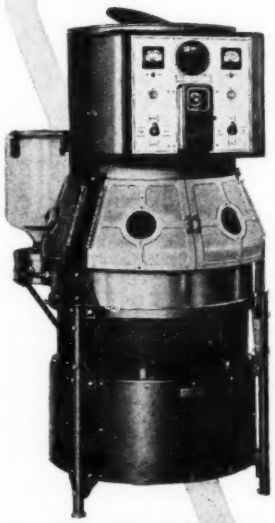

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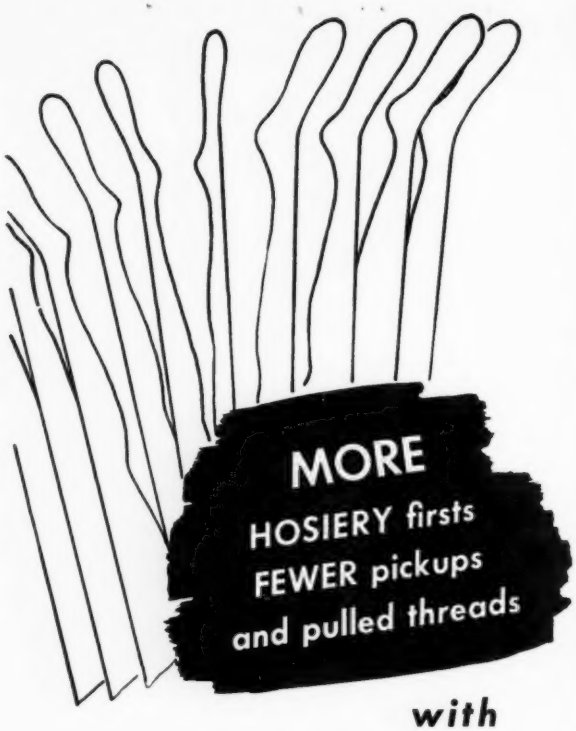

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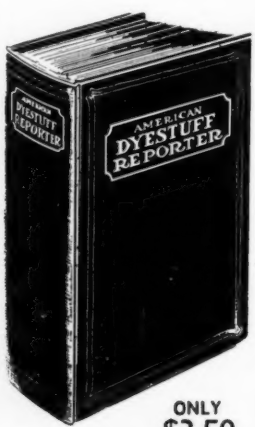

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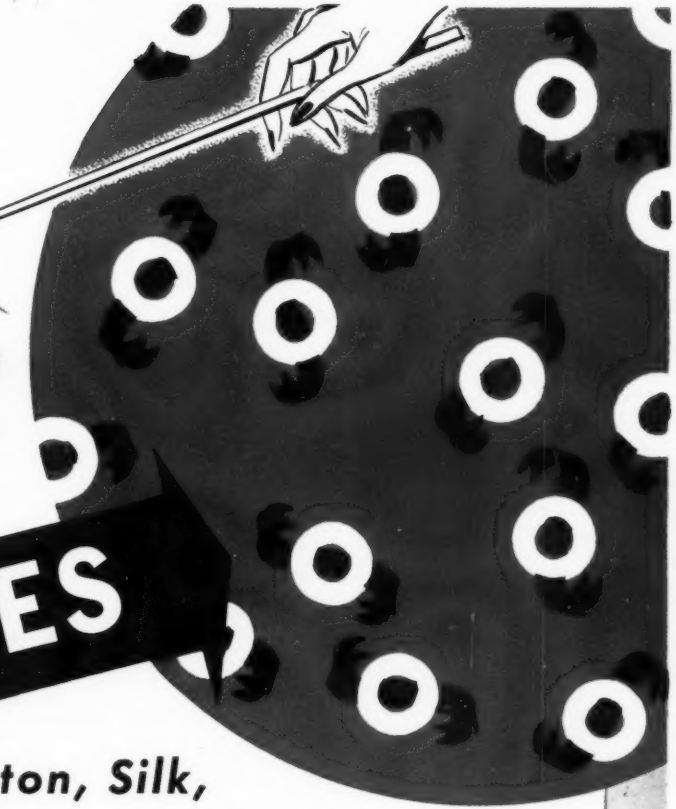

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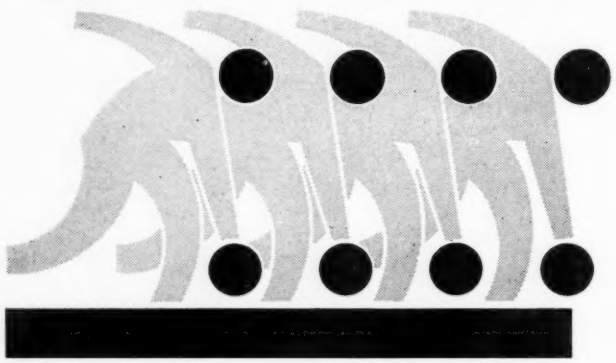

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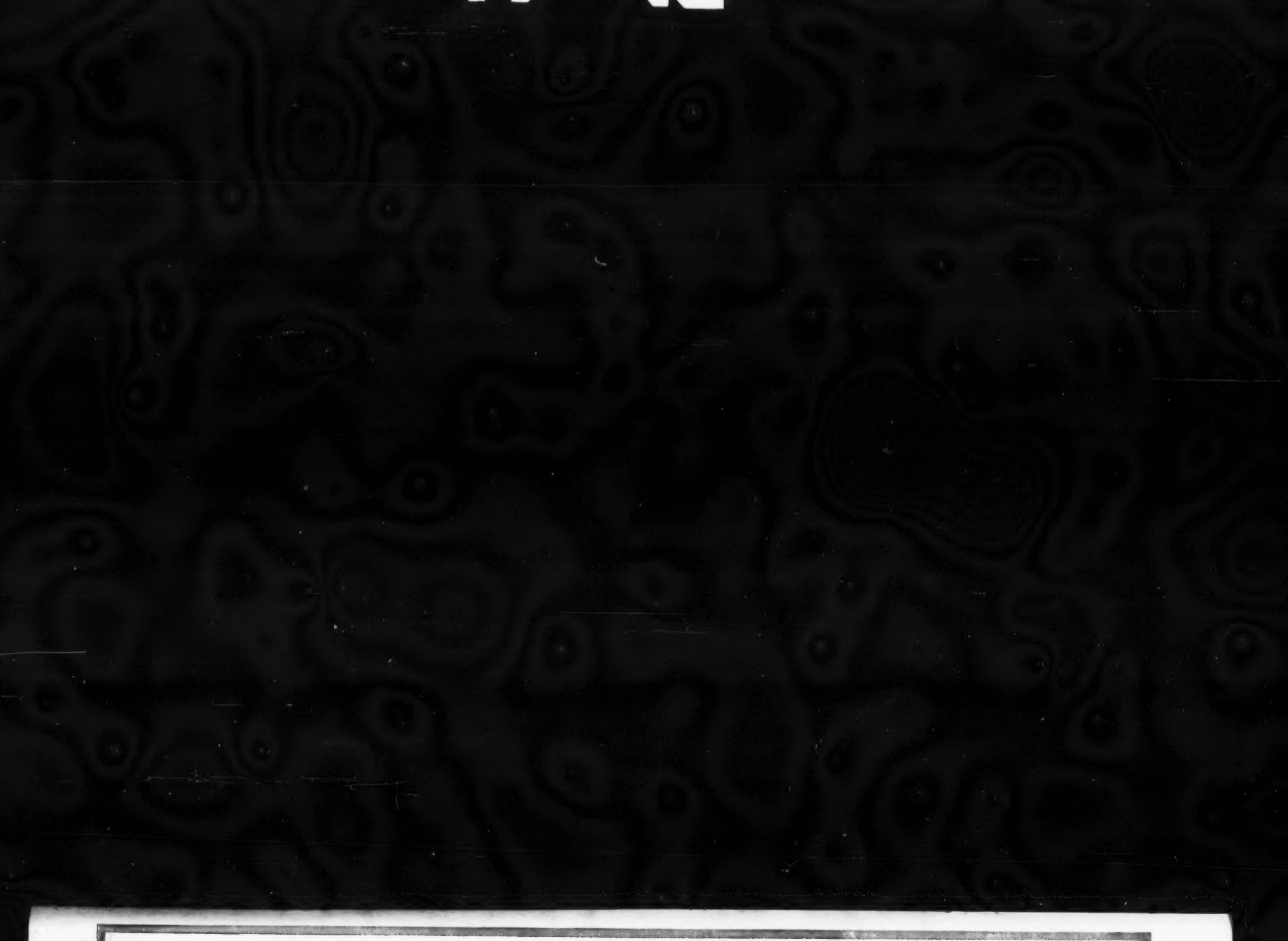
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